FOOD MANUFACTURE

Vol. XXIII, No. 12 December 1, 1948

Christmas

AS usual at this season, willy nilly we are anticipating time by nearly four weeks in order to wish A Merry Christmas to all our readers. We are not alone in this anticipation. Already the shops have dressed up and, at the time of this writing, Mr. Strachey is cautiously promising us some extra tit-bits.

To be realists is the modern fashion, but at Christmastide we can be permitted to indulge in a little fantasy. That Scrooge and Bob Cratchit are not real people but only abstractions has been said of those creations who still delight some of us every Christmas. There must be few of us who fail to react to something akin to that mysterious incense sprinkled from the torch of the Ghost of Christmas Present.

Dickens has been accused of sentimentality—let us also be guilty of it for three whole days. Let us believe in the Cratchit family, in Scrooge's nephew, and even in the conversion of that old skinflint himself, and in the abandonment for the nonce of inhibitions and preoccupations, let us echo Tiny Tim's words, "God bless us, every one."

Food Plant Position Obscure

The decision of the Minister of Supply to free all types of food manufacturing and food processing machinery from control under the Machinery, Plant and Appliances Orders does not necessarily mean that such equipment will be available in greater quantity. What the Minister has done is to free the engineering firms from the obligation to obtain licences from his Department for the manufacture of machinery and plant. No change has been made in the allocations of raw materials to the engineers, who will therefore be unable to manufacture any additional machinery as a result of the change. In some instances they may be able to expedite manufacture after receipt of the raw materials because they have no longer to await licences.

The engineers will be responsible for allocating their output between the home and export markets. They will, in fact, continue to export as much as possible, and several dairy engineers stated at the London Dairy Show that most of the orders they had booked were for export. If, however, import restrictions in overseas countries or other circumstances should limit the ability of engineers to maintain exports at the present level, these firms would be able to sell a larger quantity of plant to home food manufacturers provided that their allocations of raw materials remained unchanged.

Steel is the chief of these materials and its allocation is still controlled by the Ministry of Supply. In view of the importance of the export market it is possible that firms who find themselves unable to maintain their present volume of exports may have their steel allocations cut, in which case the home market will suffer.

It is not yet known what demands the defence programme will make on the available supplies of raw materials, but it is abundantly clear the home civil market will have to provide a very large proportion, and that the food manufacturing industries, in common with other industrial users, will be affected. The supply position regarding machinery and equipment for the home food manufacturing industries in the immediate future is consequently obscure in spite of the so-called de-control.

Food, Nail Varnish, and Cracked Cups

There is a distinct movement afoot in the direction of increased hygiene in the handling of food. Guildford staged a campaign last March; in Stoke-on-Trent food roundsmen are going to have to wash their hands; and recently there has been must talk in Lambeth. The remarks of the Mayor have received considerable publicity. He attributed food poisoning to cracked cups, bent cutlery, and the use of nail varnish by waitresses. That there is not going to be any further nonsense like this in Lambeth is the determination of the Mayor. On seeing a bit of chipped china, like his opposite number of Hamelin,

Bless us! cried the Mayor, what's that?

A writer in *The Municipal Journal* discounts (with us) the danger of nail varnish, and suggests

that nothing more pathogenic than what a Frenchman might call a *tremblement* of the heart could result by being served by nail-polished fingers. He also discounts the perils of cracked china, but here we cannot agree. In 1945 Dr. Linfoot, writing to the *Lancet*, gave a horrid little list of bugs found in the cracks of washed cups, many commonly associated with stomatitis and with mouth and germ complaints generally. When these matters are discussed, there are people who decry such warnings. "A peck o' dirt before you die" is their motto, but it doesn't do to take it in one go.

Another old adage commencing "What the eye doesn't see . . ." used to comfort the Victorians, and perhaps it is just as well not unduly to investigate the bacterial contents of those public-house glass-swilling basins or those used for "washing" cups on the tea trolleys on railway platforms.

When an "outbreak" of food poisoning occurs, involving a dozen or so cases, the papers published about it have many of the features of a first-class detective story. Like many aspects of modern life, values are sometimes strangely distorted. While wishing the Mayor of Lambeth every success in his cleaning-up campaign, could we ask him also to use some of his undoubted enthusiasm in an attempt to reduce road deaths, which take a toll of human life immeasurably greater than does food poisoning?

Protecting Vitamin A

Relief from the world-wide shortage of growth-essential vitamin A is promised by a chemical discovery announced at a meeting of the American Chemical Society.

A powerful chemical bodyguard which will prevent rapid destruction of the delicate vitamin by oxygen in the air has been developed, according to a paper presented by Charles J. Kern, Thomas Antoshkiv, and Michael R. Maises of the Research and Development Laboratories of the International Vitamin Division of the Ives-Cameron Company, Brooklyn, New York.

The new protector, which further conserves the vitamin by increasing its absorption by the blood, is a mixture of 4 per cent. lecithin, the compound used to make chocolate candy smoother, and 2 per cent. tocopherol, or vitamin E.

Vitamin A, obtained commercially from fish liver oils, is so fragile that it is readily destroyed by oxygen in the air at ordinary room temperature, and this quality has constantly presented the manufacturer of vitamin A products with the problem of preventing deterioration if the consumer is to benefit from his purchase.

In an extensive search for a chemical to guard the vitamin from oxygen, many substances were tested under widely varied conditions, and the lecithin-tocopherol mixture proved most successful.

In view of the world-wide extent of vitamin A shortage the protection afforded by the mixture and the improved absorption of the protected product are of real significance in relieving such a shortage and in protecting the public using vitamin A.

Fruit Juice—A New Development

The possibility of using ion-exchange methods to suppress the fermentability of fruit juices is suggested in the recently published 1947 Annual Report from Long Ashton. Ion-exchange treatment of juices is not, of course, new in itself; it has been considerably developed, especially in America, for reducing acidity. But ion exchange brings about a significant reduction in various cations and anions in the juice, and the Long Ashton "hunch" was that some of these cations and/or anions might be vital nutrients for fermenting organisms; their removal or reduction by ion exchange would leave a juice far less suited to yeast multiplication. Preliminary experiments confirmed this view—"ion-exchanged" apple juice fermented far less readily than untreated samples of the same juice.

Two important lines of development seem to arise from this work. First, this may be the basis of entirely new methods for obtaining sterility in the apple juice industry. Second, it may throw a good deal of light upon the rather obscure subject of the trace mineral needs of micro-organisms; for the minerals removed by ion exchange can be identified and they can be separately re-added to the treated juices until a suitable diet for yeast development is again built up. It is clear from the paper by Drs. Challinor and Pollard, and Miss Kieser that this second line will be followed up; it may lead to results of some significance for fermentation industries.

We do not feel so happy about the ion-exchange idea as a method of juice sterilisation. Ion-exchange treatments in these early tests have reduced the ash content of apple juice to between 17·5 per cent. and 1 per cent. of its natural value according to the number of treatments. Juice sterility is one thing, but the natural mineral content of juice, especially with the apple, is

another. The old adage about the daily apple and its effect upon the G.P. has always seemed to us to be soundly rooted in nutritional wisdom, whether apple juice defies the vitamin seekers or not. Not to put too fine a point upon it, we suspect that the apple's value is aperient, and this may well be a function of its mineral content. De-mineralised apple juice may not ferment easily, but will it be good apple juice? It is perhaps too early to raise queries with an entirely new piece of research, but the point might possibly be considered in further investigations.

More Verbal Wisdom

In the June issue of FOOD MANUFACTURE we drew attention to Sir Ernest Gowers' masterpiece, *Plain Words*, and we hardly expected that the year 1948 would produce another magnificent contribution to the subject of functional English. Reginald O. Kapp, a Professor of Engineering in the University of London, has done for the scientist what Sir Ernest did for the Government or industrial administrator. Indeed, Professor Kapp's book, *The Presentation of Technical Information*, will be considered by many to be a superior achievement to *Plain Words* because it has to deal with a more complex problem.

Professor Kapp makes it plain that it is part of the scientist's duty to be able to explain his work clearly. He pours scorn upon the lazy tradition that scientific facts and theories should be "quarried" out of books and papers by unfortunate readers and students who must at all costs keep abreast with scientific advance. On the other hand, he makes no concessions to the shallower policy of "popularisation"; it is not rhapsodic prose that is needed in technical writing—it is plain and straightforward readable English, with its sentences uncomplicated and its subject matter arranged in digestible order.

If chemists, engineers, and biologists are honest with themselves, they will realise that they are the principal sufferers from verbal obscurity in their literature. It is they who have to read the papers in the journals, and often enough in their own hours of leisure when the mind is tired from the day's routine. It is they who attend meetings and listen politely to oral papers which time and time again pour out facts and ideas at too fast a pace and in sentences that are far too long for immediate reception; and even those who gallantly propose and second votes of thanks are often privately hoping they will understand what it was all about when in due course the paper appears in print.

Moreover, there is the technical report that scientists have to present to directors and general managers. To achieve clarity without losing objectivity and to emphasise the main conclusions without obscuring their relevant conditions is the most difficult task of all. Is there any figure in industry more tragic than the Chemist-Who-Is-Never-Listened-To, or the Technical-Man-Who-Told-Them-So-But-Wasn't-Believed? Is there any situation more wasteful? Yet the fault lies more often than not in the man himself. His colleagues have wanted all his help, but he has made no concessions to their digestive capacity. Brilliance is not necessarily the passport for the journey from the back-room to the board-room; more often it is the ability to "put over" ordinary scientific facts and opinions.

Food Control in St. Marylebone

It is pleasing to note that the percentage of adulterated samples is again lower than in previous years, being only 1·1 per cent., according to a report submitted by Mr. Thomas McLachlan to the St. Marylebone Borough Council. This figure would have been even lower had it not been for four samples of meat, which consisted of horseflesh, being sold without a disclosure to that effect. An "informal" and "formal" sample of coffee were both found to consist of coffee and chicory, and the only two other samples found not to conform with requirements were one of breakfast food and one of pea flour, both of which were very old stock and had consequently become inedible.

The percentage of adulterated samples in St. Marylebone is lower than in most other areas, largely because of the custom of sampling the general range of foods normally bought by the housewife, and of not troubling to any appreciable extent with those preparations specially packed to catch the unwary purchaser's eye. Some other authorities pay particular attention to these so-called commodities and therefore find an apparently larger percentage of adulterated foods. However, whichever method is adopted, Mr. McLachlan's experience is that the percentage of adulterated samples has fallen considerably since the introduction of food standards and labelling requirements by the Ministry of Food.

Although these standards have increased the work of the public analyst in many directions as regards the amount of analytical work required, they have made it much easier for him to decide whether a sample is or is not satisfactory according to law. Where no standards exist it is the duty of the analyst in the first place to consider

from the appearance, composition, and advertisements of a food whether it complies with what a reasonable man would expect, and this is not always a simple matter to decide.

One other tendency resulting from the introduction of these food standards is that defendants are finding that the courts more readily accept pleas that no standard exists for a particular article. The result may be that the Minister of Food may find himself in the invidious position of being forced to increase the number of standards for foods, and consequently would be subjected to the complaint that the nation is being still further controlled by ministerial orders instead of by parliamentary legislation.

Sea-going Cannery

The s.s. *Thule*, 10,000 ton tanker, which sailed from Liverpool for the South Atlantic on October 24, has been hitherto employed in carrying fuel oil to the fleet of United Whalers, Ltd., returning to its base loaded with whale oil.

This year a complete canning plant has been installed in the forepart of the vessel. During the coming season, 2,000 tons of selected cuts of whale meat will be taken from the factory ship *Balaena* and canned in different forms a few hours after the whale has been killed.

Small consignments of canned pack made from the frozen whale meat have been on the market, but these have not been large enough properly to test it. The *Thule* shipment will not only be larger, but probably better by reason of being canned while the meat is in the fresh state, and will afford a better indication of the possibilities of overcoming the general prejudice against whale meat. It should be welcomed as an unrationed protein food.

The degree of acceptance by the public of the new canned article will depend on its quality; its price will also be an important factor. It should not be offered as a luxury article since protein is not so necessary for adults as for children and adolescents.

Fish and Chips

A blessing has been pronounced by the Ministry of Food on fried fish and chips. The allocation of more fat to encourage more fryers reminds us how Britain has ever been in the vanguard in this trade. The end of World War I, for example, saw a British army of occupation demanding fish and chips; hence the commodity had to be introduced into Germany, with consequent good business for our country's range-makers. The selling of this equipment was a trade outlet long before drives for increasing exports became a panacea for British recovery. Italy enticed a British manufacturer to go over and demonstrate his goods. South African records tell of a dairyman-emigrant from Cardiff, finding his capital dwindling in his own line when "exported," set up a Cardiff-made range and made fish-and-chip history in the Southern Hemisphere. Yet another example of publicity ensured for fish and chips was provided by the British Trawler Federation on appreciating how big demands for their catches came as a result of extolling the virtues of fried fish.

In the history of the potato, telling how Parmentier of Paris was succeeded by John Snell of Ormskirk, there should be a comparable chapter telling how the *pommes de terre frites* of smart Parisian restaurants found a counterpart in today's Lancashire chipped potatoes wrapped in yesterday's newsprint. Fish-and-chip frying, however, needs no further literature than those two mighty volumes by H. T. Rees entitled *The Modern Fish-Fryer*. The work surprises one with the many ramifications and problems of the trade. "The author does not profess to know all . . ." is a modest opening, to which we reply that we wonder whether there is anything more to be said. Restaurants and range construction, fats and fermentation of batter, food values, potato diseases, dial thermometers, and such sidelines as sauces, vinegar, and fish-cakes are included, and even chapters concerning credit and on types of customers.

The author rightly deplores fish-frying officially classed under "Offensive Trades" with tanning and manure-making. And when it comes to illustrations of super-smart fish restaurants, King's Cross may come high on the list; but Yorkshire and Lancashire top them all as true homes of fish and chips, a food sustaining the industrial north. If this is doubted, the sceptic might go on a long hike on Pennine height or wild moorland, preferably in a cold spell, then come down to one of those stone-built villages or suburbs of grim industrial towns; then into the warm shop, and clutching the hot meal between numbed fingers, he will forget etiquette, Dover soles, and gourmet's dishes.

TO AUTHORS

FOOD MANUFACTURE is prepared to consider the publication of any books on scientific and technical subjects which authors might care to submit.

Baby Foods at Greenford

The rebuilding of the Glaxo Food Wing, severely damaged by enemy action in August, 1944, has now almost reached completion. The task of demolishing the ruined premises was begun late in 1946 and reconstruction commenced in the following January on a 13,000 sq. ft. site.

Newly opened tins of dried milk powder are tested for freshness.

THE new wing comprises a basement, with ground, mezzanine, and first floors, and is equipped throughout with modern British plant. The final stages in the manufacture and packing of the company's food products, notably Ostermilk, Farex, and Glucodin, are carried out in this wing. The first and mezzanine floors are devoted to the blending and sifting operations, leaving the ground floor for mechanical packing and bulk storage. The new premises also accommodate the analytical laboratories.

Ostermilk is a roller processed dried milk and contains not only the primary food constituents but the essential accessory food factor, vitamin D, together with iron. Two varieties are made: Ostermilk No. 1, made with dried full-cream milk, modified in fat and protein content by the addition of lactose to render it suitable to the infant's digestive capacity in the early months of life. Ostermilk No. 2 is dried milk with full fat and protein content. Table I shows the composition of these two products.

TABLE I

Constituent.	*Ostermilk No. 1 Dry Powder (Per Cent.).*	*Ostermilk No. 2 Dry Powder (Per Cent.).*
Fat	19·0	26·5
Protein ..	18·1	26·0
Carbohydrate ..	56·0	37·5
Mineral salts ..	3·9	5·6
Moisture ..	1·9	2·8
	(Per Oz.).	*(Per Oz.).*
Calorific value ..	137	144
Iron	1·1 mg. (40 p.p.m.)	1·1 mg. (40 p.p.m.)
Vitamin D (International Units added) ..	320 I.U. (800 I.U. per reconstituted pint).	320 I.U. (800 I.U. per reconstituted pint).

Preparation of Ostermilk

The first stage in the preparation of Ostermilk is the opening of the 56 lb. tins of dried milk, much of which comes from the company's subsidiaries in Australia and New Zealand. Immediately upon opening, the contents of the tins are tested for freshness. This is carried out by an operator who was specially trained for this task and who has been engaged on it for nearly thirty years.

The milk, having been passed for quality, is de-

On the blending floor. Filling the feed hoppers to the sifting machines.

Filling the blender with dried milk powder used in the manufacture of Ostermilk. In the background are the feed hoppers to the sifters.

The powder is weighed automatically and tipped into the bag. Approximately 1,000 tins are filled every hour.

Bases of the Glucodin tins are seamed prior to packing for export.

livered into a hopper leading to a blender having a capacity of 1 ton. From there it travels to a mechanical sifter, and thence, by gravity controlled feed, to the filling and packaging department.

The same routine is carried out for the production of Ostermilk No. 1 and No. 2.

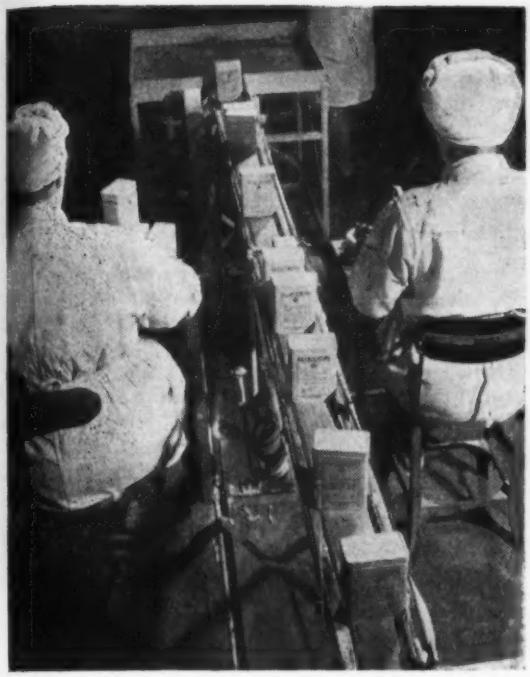
Filling and weighing are carried out automatically into a bag and the filled bag introduced into tins. Approximately 1,000 tins an hour are filled in this section.

Composition and Preparation of Glucodin

Glucodin is a finely powdered medicinal glucose (98·64 per cent.), vitamin D (calciferol) 250 I.U. per oz., calcium phosphate, and calcium glycero-phosphate. It is a source of immediately available energy and nourishment, and is used for a number of disorders and conditions.

The preparation of Glucodin involves a series of interesting operations. The glucose is introduced into a hopper, whence it goes through a vibratory sifter, and is then carried up to an automatic weighing machine, where proportions of calcium salts and vitamin D are added. Conveyed by gravity to the blender, it is then discharged on to an ingenious vibrating conveyor which has several points of delivery to the floor beneath, where it is filled into tins.

The tins of Glucodin for export are double seamed, and are then placed on a



travelling conveyor where operators affix tape to the lids.

In the case of the round Ostermilk tins, the application of the tape is effected automatically, but with the rectangular tins it is done by hand.

The tins are packed into cartons, which are carried by conveyor to the wiring table, where they are wired by a semi-automatic strapping machine, and so to the despatch room.

Left: Tins of Glucodin being conveyed to the operatives who affix tape to the lids.

Above: An automatic taping machine on the Ostermilk production line.

Preparation of Farex

The preparation of Farex, which is a cereal food for infant weaning, is also carried out in the new wing. It is composed of pre-cooked wheat, oat, and rye flours, in which yeast is included and iron and calcium salts incorporated. Vitamin D is added in crystalline form. A special feature of this product is that it is already cooked and can be quickly prepared.

Its composition is shown in Table II.

TABLE II

	Per Cent.
Protein	13·4
Fat	2·5
Carbohydrate	73·5
Mineral salts	3·6
Fibre	0·5
Moisture	6·5
	Per Oz.
Iron	6 mg. (1/10 grain)
Calcium	212 mg. (3 1/5 grain)
Phosphorus	112 mg. (1 7/10 grain)
Vitamin D (calciferol)	1,000 I.U.
Calorific value	110

SOME SUPPLIERS OF EQUIPMENT

Volume filler: *Alite Patent Machine Co., Ltd.*
Chairs: *The Tan-Sad Chair Co.* (1931), *Ltd.*
Weight fillers: *Automatic Weighing and Packing Co.*

Packs of the baby foods travel along a belt conveyor while operators put the finishing touches to the packs.

Unknown Trace Nutrients in Cow Manure

TWENTY to fifty hens running freely and picking up much of their diet from wastes are a traditional by-product of most mixed farms. Recent American research has shown that there is more than freedom of range in this method of keeping poultry—for chickens and turkeys cow manure is a valuable source of an unknown growth-promoting substance, possibly yet another vitamin. This discovery has followed from the work on synthesis of vitamins like riboflavin by bacteria in the rumen of cattle. Chicks on a low-grade diet made better growth when proportions of cow manure, dried at 45° C., were added to the feed, and comb growth was particularly stimulated. When this dried cow manure was added to the feed for laying hens, egg production was reduced though hatchability was increased.

Less Eggs, More Hatchability

It seems, however, that more than one influence was at work, for if the manure was dried at 80° C. the higher drying temperature destroyed the growth factor which affected the comb and which decreased egg production, but the factor which stimulated general growth and increased egg hatchability remained. These effects, however, could only be regularly shown when the chicks or hens were on a low-grade diet, low-grade in America meaning a diet without animal protein, *e.g.* some fish meal or meat and bone meal. Actually an all-vegetable diet was about equally enhanced by the addition of 5 per cent. of fish meal or the dried cow manure.

Research has so far suggested that unknown trace nutrients of vitamin type are responsible for these effects. The fully grown chicken can synthesise the factor in its own digestive tract; no doubt this is what occurs when hens are kept on an adequate diet and therefore no extra growth results from the addition of cow manure in such cases. The same factor must also be synthesised by the cow in her rumen, or it would not be present in manure. Very powerful concentrates of this factor have been prepared from cow manure; one of these was markedly effective when fed as 0·004 per cent. of a poultry diet.

Necessity for Further Research

Practical tests have shown that no off-flavours or odours are developed in poultry produce if the proportion of dried manure in the feed does not exceed 10 per cent. The U.S. Department of Agriculture, however, are not yet recommending the use of dried manure as a feed constituent as it is felt that further research is required to check the possibilities of spreading disease.

This development seems to be of great significance to poultry production in Britain; far more than in America are our flocks of hens kept on a low diet. With modern poultry farming on the battery principle birds rarely scratch at the ground, let alone have the opportunity of feeding upon manure heaps in a farmyard. By adding a few grams of the concentrate from manure to a hundred pounds of poultry-feed, the growth rates of young chicks were doubled. The commercial production of such a concentrate is worthy of urgent investigation; such a product would be of value both to the small back-yard poultry keeper and to the large-scale specialised poultry farmer, especially where the rapid raising of table birds is required despite the continuous shortage of high-protein feedingstuffs.

It is not so long ago that we learnt that one of the virtues of animal manures as plant foods was their content of growth-promoting and root-developing substances. Now it looks as if the reason the chicken crossed the road was to get to a manure heap. In agriculture scientific progress is often no more than a rationalisation of ancient methods, a technical explanation of what our forefathers did for the plain and simple reason that it "worked."

Egg White Protein Best of All

THAT egg white was a richer source of nutritious protein than egg yolk was reported by Professor Walter C. Hess and E. L. Everett of Georgetown University, Washington, D.C., to the Chemical Society of Washington, a section of the American Chemical Society.

Describing recent research in which they analysed the protein fractions of whole eggs, whites, and yolks, the chemists declared that the growth-promoting value of proteins from whole eggs was greater than that of meat or fish proteins, and was equalled only by lactalbumin, one of the proteins in milk.

It was further pointed out that the principal protein of milk, casein, does not have as high a biological value as egg protein.

The pure egg proteins were obtained by removing fat and carbohydrates from the egg, and then the fractions were analysed, being separated into their building blocks, the amino acids.

In general, the whole white protein was slightly higher in all the essential amino acids than the whole yolk, and the whole egg protein represented the average of approximately 65 per cent. white and 35 per cent. yolk.

Biologically, as measured in rats by the amount of weight gained per gram of protein fed in an otherwise complete diet, the white protein was the highest, the whole egg was next, and the yolk third in value.

Electronic Preservation of Foods

F. J. ERROLL, M.A., A.M.I.E.E., M.P.

Fifty years ago Professor J. J. Thomson, the physicist, discovered and named the electron as the fundamental negative particle of electricity. Since then the research into the electron has become so intensive as to be labelled "electronics," while the application of this new science in peace and war has produced such developments as radar and television, and allied devices for industry with almost uncanny powers.

Now, in the electron's Jubilee Year, comes news from the United States of the capacitron, an electronic apparatus for the sterilisation of foodstuffs.

THE capacitron experiments properly began in Germany in the early 'thirties, during the European race to develop atom-smashing instruments. Two young German scientists, Dr. Arno Brasch and Dr. Friedrich Lange, built a three million volt impulse generator and a laminated gas-cathode tube, and used this equipment to study the effects of ultra-high voltage beams of electrons in food sterilisation and the destruction of cancer in animals. With the start of the Nazi regime, Brasch left the country and went to the United States.

Here he was able to contact several influential financiers, and in 1943 a company was founded with a capital of 250,000 dollars to continue the experiments into the sterilisation of foods, drugs, and medicines. Another Berlin-born scientist, Dr. Wolfgang Huber, partnered Brasch in the practical development of the company, Electronized Chemicals Corporation, and in 1946 the first American capacitron was in operation.

The equipment was built in an old ice-house in a remote part of Brooklyn, New York. When the author visited the laboratory last year he was struck by the contrast between the drab, commonplace façade and the breath-taking mass of apparatus, towering to the high ceiling, and outdoing even Hollywood's concepts of future scientific research.

Mass of Apparatus

First there is the impulse generator, consisting of a number of capacitor banks, charged in parallel over-charging resistances, using the ordinary 220-volt alternating current, converted to direct current for charging. Dr. Brasch has described this generator as "a little lightning maker," and it does, in fact, build up the 220-volt current to powers of the order of 3 to 4 million volts. This charge is released through adjustable spark gaps to a specially designed laminated vacuum tube immersed in lubricating oil. At the bottom of this cathode device is an aluminium window, through which the billions of electrons are discharged at the subject, like bullets out of a giant gun.

The cathode gun can be fired in bursts varying from 1/10,000 to 1/1,000,000,000 of a second. According to the length and power of the electronic beam, so the penetration depth of the irradiation can be regulated.

The early experiments into the sterilisation and preservation of foodstuffs were not entirely successful. The aim was to use the electron beam to check the biological effects which produce decay, and this was achieved. But irradiation also produced a number of undesirable side reactions, such as the formation of hydrogen peroxide, which left a bad effect on the taste of the subjects, and at the same time limited the length of preservation.

Flavour and Appearance Unimpaired

It was found, however, that under proper outside conditions these side reactions could be eliminated, and by carefully adjusting the length of irradiation raw foodstuffs were preserved without any impairment of flavour or appearance. In this way raw meats, such as beef, pork, chicken, and veal, were kept from six months to a year in a room at normal temperature. Vegetables, fruit, and flowers irradiated at the time of the author's visit, nearly a year ago, are still as fresh as the day they were "electronised."

Lean beef, poultry, and eggs were the most easily preserved of the proteinous foods, while of the fruit and vegetables, mushrooms, green peas, and tomatoes gave the most satisfactory results. Milk products and cheese, which are highly susceptible to changes in taste and appearance, were difficult subjects for the capacitron, and certain fleshy vegetables and fruit, such as apples, pears, lettuce, and strawberries, sometimes collapsed under electronic bombardment. Oysters, shrimps, and lobsters developed a smoky flavour after irradiation, but were preserved without difficulty.

Certain foodstuffs, however, showed rather pronounced changes when exposed to this type of radiation. Bananas, for instance, became bruised and pulpy, lettuce wilted, and strawberries became

partly bleached. Further research is being undertaken with the ultimate aim of eliminating these side effects.

Sterilisation by the capacitron differs from other methods of preservation in that there is neither heating nor cooling nor chemicals. And despite the terrific power of the electron beam, there is no impairment in the character of satisfactory subjects. The electrons are directed under the surface of the subject without damage to the surface. This is why electrons may have a great future in medical research, for deep-seated cancers in rabbits were destroyed by conveying the electron beam through hollow needles without harming surrounding healthy tissue of the fur and skin.

Further work with the capacitron to discover its possibilities both for medical research and for the commercial preservation of foods and drugs has been financed by a group of the leading American food firms. The first industrial capacitron is now nearly complete and will be in operation within the next few months. This pilot commercial model is smaller in size but is far more powerful. It is said that it will be able to sterilise 40 lb. of food or drugs in one burst, and operating at ten-second intervals will handle 7 tons an hour.

The backers of the capacitron experiments believe that it has a very promising future; but they also believe that it does not portend the redundancy of other methods of preserving foods. Instead, the capacitron, they say, will complement the refrigeration, deep-freezing, and canning industries.

Syndicates have been or are being formed for exploiting the capacitron rights in Latin America, Scandinavia, and Britain, and a Belgian chemical manufacturer is understood to have been appointed the European agent for the American company.

The World Fruit Trade

EVERY aspect of topical and practical interest to those connected with fresh, canned, and dried fruit, from the production end, through all processing phases, to retail distribution is contained in the new and enlarged edition of an annual* devoted to the fruit industry.

Many interesting articles have been incorporated in this new edition, including a survey of fruit production in England, a description of new packing ideas and methods, developments in the transport of fruit, quick freezing methods, a treatise on the freezing and storage of fruit juices, a survey of dried fruit production and distribution, and a chapter on nuts.

A comprehensive directory of firms engaged in the export, import, canning, packing, transporting, and storage of fruit and fruit products, completes a work of value to all engaged in this industry.

* *The Fruit Annual and Directory*, 1948-1949. Edited by H. F. Tysser. Pp. 348. London. Price 20s.

Food Processing Developments

SOMETHING of direct or indirect interest to practically every branch of the food industry was included in the programme of the Institute of Food Technologists at their Eighth Annual Conference.

During a discussion on colour changes in foods, Professor M. A. Joslyn, University of California, showed how increasing biochemical knowledge is explaining commonly observed colour changes and paving the way for rational control of them. Food technologists have learned that the browning of chlorophyll-containing materials is usually due to replacement of magnesium by hydrogen in the porphyrin nucleus. Referring to the discoloration of apple tissue as an example of enzymic processes, Professor Joslyn said it had been found that browning is not apparent until the ascorbic acid level is reduced to zero by the phenolase enzymes. It is now recognised that several types of reactions may be involved in the browning of food, depending on *p*H, temperature, and concentration, which affect rate and type of reaction.

Standardising Pectins

Methods by which pectins may be standardised received attention. W. A. Bender, General Foods' Central Laboratories, suggested a standard of jelly strength, 60·7 g. per sq. cm. of cap surface—as determined by the breaking strength of jelly slices by the Tarr-Baker test. He said that strength of jelly pectins determined this way is in linear relation to the amount of pectin in jellies with the same *p*H and solids content. G. L. Baker and C. W. Woodmansee, University of Delaware, showed that emphasis should be placed on preparation of test jellies instead of upon the testing instrument.

Encouraging efforts to improve the nutritive quality of all foods, Conrad A. Elvehjem, University of Wisconsin, said that certain specific deficiencies in large segments of the population could best be remedied by the addition of indicated nutrients to cheap staple foods, but disapproved of indiscriminate fortification of general purpose foods.

In a session on frozen foods it was stated that sugar exerts a marked inhibiting effect on enzymatic oxidation of ascorbic acid by reducing the rate of diffusion of oxygen in the syrup. The amount of copper and iron in the syrup also influences the extent to which ascorbic acid is oxidised.

A new crystallographic method of studying changes in processed food was described in a paper prepared by Hans Friess, Technische Hochschule, Karlsruhe. The nature of food substances can be determined microscopically from characteristic crystallisation patterns found by adding them to cupric chloride solutions. These patterns, or microforms, are weakened by freezing and destroyed by heating up to 70° C.

Left: Fruit packed in sugar syrup. Right: Fruit packed in sugar syrup to which ascorbic acid has been added.

Ascorbic Acid in Fruit Processing

The use of ascorbic acid in the processing of frozen fruits, as applied by Hoffmann-La Roche Inc., is considered the most effective single agent for retaining tree-ripe colour and flavour of frozen fruits after normal thawing. During 1947 the company was able to add entirely new knowledge on the freezing of apples, bananas, and pineapples to methods already used for peaches and apricots.

THE addition of small quantities of crystalline ascorbic acid during the pre-freezing process delays the browning and flavour changes which occur during the thawing of certain non-blanched cut fruit. The following figures, representing milligrams per pound, are of fruits with low ascorbic acid content: apples 23; apricots 18; bananas 45; peaches 36; pears 18; and plums 23. Fruits with high ascorbic acid content are: strawberries 270 and oranges 221. Fruits with a low natural ascorbic acid content readily discolour or brown and change in flavour on thawing due to the action of enzymes and air. Blanching before freezing sufficient to inactivate the enzymes gives a cooked flavour and alters the natural colour of the fruit, hence the use of ascorbic acid.

Foreign substances or unnatural flavours are not introduced by the addition of crystalline ascorbic acid, which is not detectable by appearance, smell, or taste. Trials show that the procedure is practical for prunes, bananas, pineapples, and fruit *purées*, while frozen berries and vegetables, having a fairly high natural ascorbic acid content, are not noticeably affected by ascorbic acid addition.

Experiments have proved that one single method of application and concentration of ascorbic acid, with or without augmenting treatments, cannot be considered for all varieties of easily oxidisable fruit. Only proved methods should be used because of the added cost of repacking frozen packs. It is emphasised that the use of ascorbic acid is no encouragement to use poor processing practices.

In freezing sliced apples by the ascorbic acid method, the interior and exterior must be protected from darkening on thawing. There are two solutions to the penetration problem: (1) the size of the slice can be reduced (the julienne cut), or (2) air or gases inside the slice can be removed by a de-aeration procedure which will permit better penetration of the ascorbic acid. Most promising supplements to ascorbic acid in freezing sliced apples were found to be chlorides

Frozen non-blanched halved nectarines, after thawing in unopened packages, packed in sugar syrup containing ascorbic acid. The fruit is still firm and the red bloom on the outer skin still apparent.

Large packs of frozen, non-blanched sliced apples packed by the dry-sugar ascorbic acid method, five hours after thawing. The recommended procedure of applying a paper disc soaked in an ascorbic acid solution has been followed. If desired a dry cardboard disc can be placed over the paper disc which helps to keep the fruit submerged.

and sulphites used in controlled amounts, with sodium chloride the most practical.

Apricots are satisfactory for freezing by the ascorbic acid method, which preserves the fresh fruit flavour and "red blush" colour. The treatment does not retard discoloration in non-blanched frozen halved apricots as long as in non-blanched sliced peaches, but properly processed ascorbic-acid-treated packs are satisfactory for the retail trade. Removal of skins permits better penetration of ascorbic acid prior to freezing.

Bananas used for freezing should have a yellow peel well flecked with brown. Ripening should be controlled and the fruit thoroughly washed while still on the stalk.

Despite some reports, the results of trial packs of strawberries do not warrant the use of ascorbic acid. Other berries possessing a fairly high natural ascorbic acid content do not noticeably respond to the treatment, although some varieties of cherries respond well.

The use of ascorbic acid in preparing fruit *purée* is recommended. *Purées* have been made from peaches, nectarines, pears, and apricots, being either non-blanched or partially blanched. Ascorbic acid is added at the rate of 200 milligrams per pound when dry sugar is introduced. Ascorbic acid should be added at this stage only if no browning takes place during the preparation of the *purée*, otherwise it is advisable to add part of the ascorbic acid before or during that operation.

Nectarines treated with ascorbic acid are attractive and possess an excellent flavour, the finished pack (fruit plus syrup) containing 175 to 200 milligrams of ascorbic acid per pound. Pears also respond favourably, although the thawed fruit may be mushy and may be improved by pre-freezing treatment with calcium chloride.

Processing with ascorbic acid has been found most effective for retarding off-flavour development and loss of colour in pineapples. An addition of 175 to 200 milligrams of ascorbic acid per pound of finished pack is made by adding the ascorbic acid when the sugar is mixed into the pack. Discoloration and flavour loss in plums are also retarded by the treatment.

It is emphasised that from the standpoint of economy, and irrespective of amounts of citric or other acids used to inhibit enzyme activity, the amount of ascorbic acid needed for effect against browning and loss of flavour should not be less than 150 milligrams per pound of finished packs of apricots and peaches. The addition of ascorbic acid to syrups should be made at the rate of 150 to 200 milligrams per pound of finished pack for most fruits.

While ascorbic acid is easily added to water or sugar syrups before use, the solution containing ascorbic acid should not be heated above 125° F. Solutions should not be excessively agitated and long periods of stirring should be avoided. If heat is used to prepare a sugar syrup it should be cooled to 80° F. or lower before adding ascorbic acid, and the use of iron or copper containers for solutions should be avoided.

BOOKS RECEIVED

Orders for any of the books listed below or reviewed in this issue may be placed with the Books Department, FOOD MANUFACTURE, 17, Stratford Place, London, W.1. It is regretted that under present conditions it is not always possible to supply books by return of post.

Treatment and Disposal of Industrial Waste Waters. By B. A. Southgate, B.A., Dip.Agric., Ph.D., D.Sc., F.R.I.C., F.R.San.I., F.Inst.S.P., P.A.Instn.W.E. Pp. 327 + vii. H.M.S.O. Price 12s. 6d.

Micro-organisms and Fermentation. By the late Alfred Jørgensen, rewritten by Albert Hansen. Pp. 550. Plates 37. London. Price 60s.

Diet and Disease

It is well known that deficiency of any essential dietary factor will inevitably lead to serious illness, usually with well-defined and characteristic symptoms. Thus lack of vitamin C will cause scurvy, lack of vitamin A will be indicated by failure in dark adaptation and xerophthalmia, while deficiency of iron will lead to one of the many forms of anaemia. On the question of the relation of diet to infective diseases, however, our knowledge is still incomplete or uncertain. Various diseases may clearly arise from eating food infected with bacteria, or even contaminated with heat-stable poisons produced in the food by bacteria before it is sterilised. It is also understood that the adequacy of the diet may affect the powers of the body to resist infections, particularly tuberculosis, although it has been difficult to obtain conclusive evidence on this point. Progress towards the solution of these important problems was reviewed at a conference held recently in Aberdeen by the Scottish Group of the Nutrition Society, under the chairmanship of Professor Dugald Baird, M.D., F.R.C.O.G.

At first sight it might be considered that the influence of diet on susceptibility to common diseases, at least in human beings, might be readily deduced from a study of public health statistics. If a poor diet results, for example, in a reduced resistance to tuberculosis, then we would expect to find a higher incidence among the poorer classes, less able to afford a good diet, than among the richer classes. While statistics have certainly supported this view, it is difficult, as Professor Baird points out, both to obtain accurate estimates of the food habits of the various classes and to decide how far factors other than malnutrition, such as overcrowding, can account for the increased susceptibility. Even if we have satisfactory evidence of the current nutritional status of our subjects, moreover, we have no assurance that their resistance may not have been influenced by good or bad food habits at earlier periods of their development, since the general physique of the adult depends so much on correct nutrition during childhood. While therefore the study of human statistics may be valuable, particularly in suggesting those diseases in which resistance is influenced by diet, extensive experiments with animals will be necessary before the general principles underlying this relationship are fully understood.

Experimental Difficulties

Numerous investigations have already been made in which rats and guinea-pigs have been given good or bad diets, and have then been exposed to infection in various forms. Early work appeared to prove that well-fed animals resisted infection with *salmonella* much more strongly than poorly fed animals, but in subsequent investigations very irregular results have been obtained. This inconsistency was probably largely due to the difficulty of adjusting the severity of the infection so as to allow differences in resistance to exert their full influence. While too heavy infection may kill all the animals, whether well or badly fed, too light infection may allow them all to survive.

Another complicating factor has arisen through some workers, in attempting to confirm the conclusions of others, having used diets which were so modified as to alter the conditions of the experiment in ways which were not intended. Thus it is well known that animals which are deprived of vitamin A are susceptible to infection of the mucous membranes, and that the infections may be prevented by giving vitamin A. If, however, a basal diet is chosen, for reasons of convenience in obtaining foodstuffs, which is deficient in many factors besides vitamin A, the apparent effects of restoring the vitamin A will differ according to the form in which it is given. Thus vitamin A will be accompanied in green vegetables by vitamin E and iron, in cod liver oil by vitamin D, or in butterfat by linoleic acid and possibly other essential nutrients. Under these circumstances considerable disparity between the results of different workers is perhaps only to be expected, since no account will be taken of the effects of factors other than vitamin A.

Diet and Tuberculosis

At the Rowett Institute, Aberdeen, the problem of the relation of diet to tuberculosis infection has recently been studied by Dr. Sengupta, working with Dr. Howie. Although they have not yet

attempted to decide the particular deficiencies which cause reduced resistance to this disease, they have obtained conclusive proof that under suitable circumstances diet may be the deciding factor.

In these experiments large numbers of mice were divided into two groups. One group was given a diet formulated in the U.S.A. by Sherman, and consisting only of ground whole wheat, dried milk powder, and salt, while the other group received a more varied diet, as used at the Rowett Institute, containing mixed cereals, fish, meat and bone meals, dried skimmed milk, cod liver oil, and salt. The mice of both groups were then injected through their tail veins with fixed amounts of a carefully standardised suspension of human tubercle bacilli.

Although both diets allowed growth and reproduction in healthy mice their effects on the abilities of the animals to resist infection were widely different. As judged by the average times of survival after injection, and by the severity of tuberculosis nodules in the lungs, the mice given the Rowett diet were much more resistant than those given the Sherman diet.

Vitamin C and Infection

Vitamin C has attracted almost as much attention as vitamin A in investigations of the relation of diet to resistance to infections. According to Dr. Geoffrey H. Bourne, reports as to the role of this factor in maintaining the immunity systems of the blood plasma have been inconsistent. Thus it has been claimed by some workers that the plasma of guinea-pigs deficient in vitamin C is lacking in complement, a factor which promotes the action between the protective antibodies of the plasma and the toxins produced by invading bacteria. Other workers, unfortunately, have failed to confirm this observation. Dr. Bourne points out, however, that careful experiments have proved that a liberal intake of vitamin C is necessary for the efficient formation of scar tissue after wounding. It seems highly desirable, therefore, that adequate amounts of vitamin C should be given to patients suffering from tuberculosis, whose prospects will depend largely on the ability of scar tissues to close up wounds in the lungs or in other tissues. This need is emphasised by the increased rate of destruction of vitamin C, which occurs in tuberculosis and in all other infective diseases.

When very large amounts of vitamin C are included in the diet the blood and tissues become saturated, and any excess is excreted in the urine. Most humans, however, keep in an ordinary state of health on an intake of vitamin C much below the level necessary for saturation, and it is doubtful whether the attainment of a state of saturation, by dosing with ascorbic acid tablets or other means, confers any particular benefit. Dr. Bourne points out, however, that we are related zoologically most closely to the gorilla, which eats about 20 lb. of green food daily. On this basis man's "natural" intake of vitamin C might be calculated as several grams daily, as compared with his customary intake in this country of about 30 milligrams.

Infections in Cattle

According to Dr. H. H. Green, diet may affect the liability of farm animals to disease in many different ways. Plants eaten at pasture may contain substances which cause infertility by disturbing the balance of the sex hormones, or render the animals unduly sensitive to the action of light. Depraved appetites may lead to the consumption of pathological material, while even sudden access to rich pasture may have disastrous results. Sometimes symptoms of deficiency of trace elements, such as copper and cobalt, may appear for reasons not yet properly understood, even although the chemical analysis indicates that the pasture is not deficient in the mineral in question.

An excellent example of the complicated chain of events which may spread diseases in livestock may be seen in "lam siekte," a fatal form of food poisoning which afflicts cattle in Africa. The germ responsible for this illness is *Clostridium botulinum*, which persists in the bones of dead animals which lie about the veldt. Some animals have a depraved appetite, or "pica," which induces them to eat these bones, particularly when they are in a putrid state, with rapidly fatal results. Extensive investigations on a disused farm indicated that the craving to eat bones was caused by deficiency of phosphorus, and that the disease could be prevented either by dosing the animals with clean bone meal or by fertilising the pastures with phosphates.

While attempts to correlate diet with resistance to infection in the human have almost always been based on the assumption that a good diet tends to afford protection, there is clear evidence that a poor diet may sometimes have the desired effect in animals. It has repeatedly been reported that livestock are much more readily infected with foot and mouth disease when well fed than when poorly fed.

Diet and Worms

Infection of farm animals, and particularly sheep, with intestinal worms is so universal that it is useless to attempt to keep animals free from these parasites. As a practical goal it seems sufficient to aim at a condition of "happy worms living in happy sheep." Poorly fed animals, however, become excessively infested, and the worms in turn must find difficulty in obtaining adequate supplies of nutriment. Helminthic infestation often becomes an urgent problem in sheep which are kept over winter with the intention of fattening them up in the following spring. Often very little fodder is available, and the animals may lose as much as a quarter of their body weight. In this emaciated condition the animals may become so heavily infected with worms

that they fail to thrive when plentiful amounts of young grass are again available.

An experimental attack on the problem of the relation of diet to worm infestation is being undertaken by Dr. Howie. Counts of worms' eggs are being made in the faeces of poorly nourished sheep and in those of sheep receiving the same diet but with suitable supplements. In sheep of the first generation to be studied no correlation could be found between diet and the rate of infestation, but in the second generation less eggs are being found in the faeces of the sheep given supplements of extra food.

Nutrition and Liver Disease

In humans the effect of a poor diet in increasing susceptibility to liver diseases is clearly recognised. Convincing evidence on this point has been obtained in studies of the condition known as "Kwashiorkor," or "malignant malnutrition," which occurs in poorly nourished African natives, and in which fatty degeneration of the liver is a prominent pathological feature.

Our understanding of the relation of liver diseases to diet has been greatly increased by animal experiments. Dr. L. E. Glynn points out that with a deficient or unbalanced diet, liver disease may arise either from an increased susceptibility to toxic agents, such as carbon tetrachloride, or purely from the defects of the diet. In studying the development of disease in rats without the intervention of toxic agents, two distinct forms of injury may be recognised: (1) a diet unduly high in fat or the amino acid cystine, and low in protein, choline, methionine, and other substances concerned in the transport of fat, causes fatty degeneration of the liver. When the animals are kept on the diet for some months scar tissue is extensively formed, leading to the hardened and nodular condition of the liver known as cirrhosis. (2) Diets deficient in cystine and other amino acids containing sulphur cause the rapid destruction of cells in restricted areas of the liver, often with fatal results.

While to some extent research has developed in two separate fields, one covering the effect of diet on resistance to toxic agents and the other the development of liver injuries without toxic agents, it is clear that the problems are closely interrelated. It therefore seems highly desirable that the diets of industrial workers whose activities involve them in exposure to toxic chemicals should be adequately supervised.

Food Poisoning

Many forms of infection or poisoning may be transmitted through the diet, but, as Professor J. Cruickshank points out, only those which cause the rapid onset of illness are described as food poisoning. Thus this term is not applied to diseases with long incubation periods, such as typhoid fever or tuberculosis, although they may both be transmitted in the food. Until about ten years ago the organism responsible for food poisoning was most often *salmonella*, but recently staphylococcal infections have been prominent.

Food poisoning may be caused by a wide variety of agents. Products containing minced meat, such as sausages, meat pies, and brawn, are perhaps the most common vehicles for spreading infection, but salmon, ham, potted meats, cream, trifle, and many other foods have also occasionally caused poisoning. American dried egg, although welcome both for its food value and for its cooking qualities, was frequently a source of *salmonella* infections, and its importation has resulted in the introduction of forty-two new types of this organism into this country.

Spreading the Infection

The infection of food with bacteria capable of causing food poisoning often occurs as the result of insufficient sanitary precautions during handling. *Staphylococci* are often present in human nasal discharge, and a worker who thoughtlessly touches his nose while handling food may well be responsible for an epidemic of food poisoning, particularly if the product has later to be dried or processed at a temperature suitable to encourage the growth of the organisms. The reality of this danger has been clearly established in observations on the growth of bacteria during the drying of fish.

Vermin are also frequent carriers of infection, particularly when cooked food is put aside for a long period before consumption. It seems probable that outbreaks of food poisoning after important public dinners are caused most often by the necessity of preparing much of the food long before the function. If storage facilities are inadequate to cope with the importance of the occasion, foods may be left to the depredations of mice and rats, whose faeces may be a rich source of *salmonella* infection.

Botulism

Food poisoning in its most deadly form is caused by *Clostridium botulinum*, which is sometimes present in soil. Its spores are particularly resistant to heat, but even if foods are successfully made sterile, the toxins produced by the bacilli may remain unaffected, and ready to paralyse the brain cells of the unsuspecting consumer.

Cases of botulism have occurred in America through the consumption of vegetables cured at home with inadequate precautions. In view of the popularity of home bottling in this country we may perhaps consider ourselves fortunate to have avoided similar outbreaks. The tragedies at Loch Maree, caused some years ago by an infamous jar of wild duck paste, however, will linger long in our memories and remind us that ceaseless vigilance against bacterial contamination is always necessary in the manufacture of preserved foodstuffs.

A Complex Relationship

It must be concluded, after consideration of the views put forward at this interesting conference, that the relation of diet to disease is highly complex. Thus we may have diseases which are caused solely by deficiency of essential nutrients, and diseases in which dietary deficiency leads to a secondary infection not derived from the foods, or to the undue multiplication of intestinal parasites. With some diseases, however, the situation may be reversed, and a good nutritional state may increase the liability to disease. Sometimes, as in the case of liver cirrhosis, disease may be incurred by an incorrectly balanced intake of nutrients rather than by simple deficiency.

When the food is infected with pathological bacteria fresh complications are introduced. We may have infections, such as tuberculosis, in which the incubation period is long. In this case the nutritive value of the diet may well be an important factor in deciding whether the organisms it contains will succeed in setting up an infection. On the other hand, we may have illnesses of the food poisoning type, caused either by active organisms or by toxins remaining over from dead organisms, which make their attack within a few hours after the contaminated food has been eaten. Under these circumstances the nutritive value of the diet must be a negligible factor in deciding our degree of resistance.

Ministry of Food

Latest Statutory Rules and Orders

The list given below is the continuation of the list of Orders published in *Food Manufacture*, Nov. 1, 1948, page 522.

No.	*Date.* 1948.	PRICE FIXATION ORDERS
1962	Aug. 29.	Order amending the Chocolate, Sugar Confectionery and Cocoa Products (Control and Maximum Prices) Order, 1944.
1985	Sept. 19.	The Tea (Prices) Order, 1948. Revokes S.R. & O. 1947, No. 892.
2113	Oct. 10.	The Glucose (Control and Maximum Prices) Order, 1948. Revokes S.R. & O. 1943, No. 1707; 1947, No. 144.
2174	Nov. 28.	Order amending the Flour Confectionery (Control and Maximum Prices) Order, 1946.
2198	Oct. 1.	Order amending the Milk (Control and Maximum Prices) (Great Britain) Order, 1947.
2236	„ 10.	Order amending the Eggs (Control and Prices) (Northern Ireland) Order, 1947.

CHICORY

2028	Sept. 20.	Order revoking the Chicory (Control) Order, 1942.

FRUIT

1884	Aug. 15.	Order amending the Canned Fruit and Vegetables (No. 2) Order, 1946.
2229	Oct. 10.	Order amending the Citrus Fruit Order, 1945.

LICENSING

2234	Oct. 10.	The Food (Licensing of Retailers) Order, 1948. Revokes S.R. & O. 1945, No. 131; 1947, Nos. 738, 1833, 1978, 2421.

MEALS IN ESTABLISHMENTS

1693	July 25.	Order amending the Meals in Establishments Order, 1946.

MEAT

2237	Oct. 10.	The Imported Meat, Canned Meat, and Pork (Requisition) (Revocation) Order, 1948. Revokes S.R. & O. 1939, Nos. 1076, 1131, 1275; 1941, No. 955.

NUT KERNELS

2291	Oct. 17.	Order amending the Nut Kernels Order, 1947.

PIGS

1935	Sept. 1.	The Pigs (Sales) Order, 1948. Revokes S.R. & O. 1940, No. 38.

POTATOES

1751	July 29.	The Ware Potatoes (1948 Crop) (No. 1) Order, 1948. Revokes S.I. 1948, No. 1116.
2019	Sept. 8.	The Seed Potatoes (1948 Crop) Order, 1948.
2199	Oct. 1.	The Potatoes (General Provisions) Order, 1948. Revokes S.R. & O. 1944, Nos. 468 and 1095; 1945, No. 1192; 1946, Nos. 329 and 1564; 1947, No. 502; S.I. 1948, No. 1130.
2200	„ 1.	The Ware Potatoes (1948 Crop) (No. 2) Order, 1948. Revokes S.I. 1948, No. 1751.

PRESERVES

1640	July 18.	Order amending the Preserves Order, 1947. Revokes S.R. & O. 1947, No. 2842.

RATIONING

1692	July 25.	Order revoking the Bread (Rationing) Order, 1948.
1821	Aug. 3.	Order amending the Fats, Cheese, and Tea (Rationing) Order, 1948.
1885	„ 15.	Order amending the Food Rationing (General Provisions) Order, 1948.
1886	„ 15.	The Sugar and Preserves (Rationing) (No. 2) Order, 1948. Revokes S.I. 1948, No. 1637.
2197	Sept. 30.	Order amending the Food Rationing (General Provisions) Order, 1948.
2319	Oct. 24.	Order amending the Food Rationing (General Provisions) Order, 1948.

The first factory operated at Awanui.

Big Game Fishing Creates New Industry

Back in the early 'thirties, while deep-sea fishing for Mako shark and swordfish in the fishing waters of the Bay of Islands, North Auckland, New Zealand, Mr. R. Greenwell, a keen fisherman of Auckland, noticed the oil smeared thickly across the jetty decking where the giant fish are unloaded for weighing for official record purposes, and started a line of enquiries concerning the manufacture of fish oil, meal, and fertiliser.

FINDING that fish oils were practically unknown in New Zealand, and that shark liver oil was the subject of strong prejudice, Mr. Greenwell accepted the challenge, and after many vicissitudes the fish liver oil industry in New Zealand is now definitely established on sound commercial lines, there being only two companies licensed to manufacture it in New Zealand.

The first factory was established at Awanui, in the far north of the North Island, and depots are now established in main fishing centres throughout the Dominion.

Practically all New Zealand fishermen are on the list of regular suppliers, and there are many others, including enthusiastic amateurs, who fish for sport and send in the livers for processing. Many of the commercial fishermen, however, concentrate on shark fishing during the season, and the only time they fish for edible fish is when bait is needed.

The fish are caught from launches—each manned by two men, who sail out whenever wind and tide are propitious into the warm waters where the sharks swarm between October and February of each year.

Lines carry up to 150 heavy hooks, and after an hour's fishing most of the hooks have caught sharks. On a bad day there are only half a dozen on the haul.

Transport Arrangements

The fish are opened on the launch, but only the livers and fins are saved; the latter are eagerly sought by the local Chinese community for shark-fin soup, while the livers fetch 1s. per lb. There is ship-to-shore radio telephone communication for advice of shoals of fish and other intelligence.

Where no freezing or treating facilities exist, specially insulated cans are provided so that the livers can be shipped to Auckland without deterioration.

In the central laboratory in Auckland three analysts supervise the processing, blending, refining, and standardising of the oils. Both an ultra-violet 328 M/U Hilger and a Beckmann spectrophotometer for vitamin determination are in operation, and a molecular still eliminates the objectionable odour and taste from the oil.

The processing room of the main plant at Auckland, showing the purifier and clarifier. In the background can be seen the freezers.

The company's fleets are now organised along thousands of miles of coastline, and their quotas are allocated with a due regard for conservation to avoid depletion of the fishing grounds for the world-famous big-game fishing. Last year alone over £20,000 was paid out to fishermen.

Mobile Research Unit

Collecting depots link the fleets with the factories in a great chain around the coasts, and most of them are equipped with modern centrifuges and other plant for rendering, grading, and processing at the point of catching. When local conditions rule out these facilities, the depots forward the livers to Auckland through the can collection system, involving the circulation of many thousands of cans, which alone represent a substantial capital.

Land, buildings, and wharf accommodation have been bought or leased, and a 43 ft. diesel boat is maintained as a mobile research and experimental unit in the fishing grounds.

These "field stations," stretching from Parengarenga in the far north to beyond Lyttelton in the South Island, are the outposts of an industry which is centred in the large modern factory in Auckland.

Work in the Laboratory

The factory occupies a site of 6,000 sq. ft. and is equipped with every modern device for the processing, grading, and blending of fish liver oils to a capacity far beyond the available supply of raw material. Future developments have been amply provided for, not only in the factory itself with its three centrifuges and other related equipment, but in the organisation as a whole, which bears comparison with the most advanced industries overseas.

The laboratories are a key point in industrial technology. The results of eight arduous years of research are represented here, for much of the apparatus and not a little of the method have been evolved by the chemists working in a pioneer field in which unceasing experiment was the price of knowledge.

Much of the apparatus used in refining, standardising, and blending the products has no counterpart anywhere, for the chemists are following their own line of research into a field of which the resources have as yet been barely touched. The laboratories are under the direction of Mr. R. W. Green, M.Sc., who is assisted by two other chemists.

Exported oils are closely checked by Government analysts of the importing countries, and in no case has the declared vitamin potency of the products failed to comply with the inflexible standards insisted upon. A sample which travelled thousands of miles in a few months, during which it was subjected to tropical conditions and exposed to air and light (both injurious to the vitamin content of fish oils), was found on assay to have lost only a fraction of its declared vitamin potency.

Processing the Livers

The processing of fish livers begins at the freezing chambers, where the loaded cans received from the depots are stored at a very low temperature. This precaution is necessary to prevent autolysis and the formation of free fatty acids. Medicinal oils should have an acid value of less than 1, and the use of partially autolysed livers would not only lower the vitamin potency but would also result in a definite "off" odour.

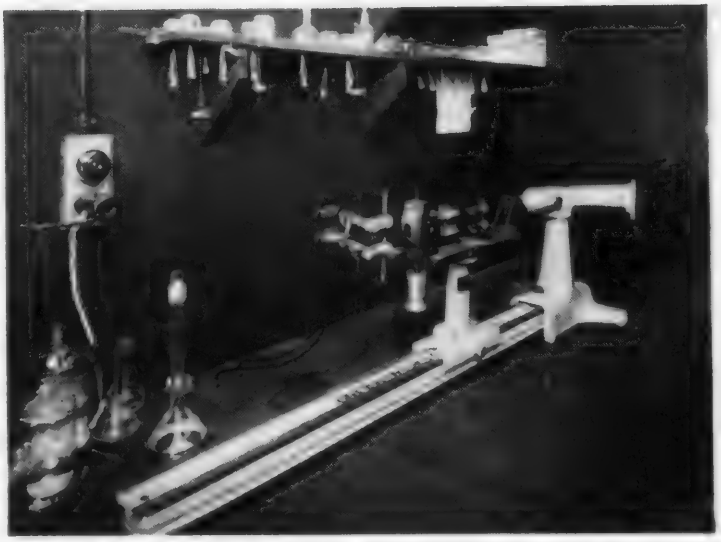
The livers are subsequently thawed, disintegrated

in a power mincer, and pumped into vats for digestion under a steam process for a period of from one to forty-eight hours according to type. This process liberates the oil in preparation for extraction, for which the *purée* is piped from the vats to a battery of centrifuges.

In these machines, which have been especially built for fish liver oil extraction, the tubular bowl, spinning at 15,000 r.p.m., separates the oil from the water and waste by the application of centrifugal force. The *purée* is injected into the spinning bowl at approximately half a gallon per minute.

Because of more *purée* being forced in, these two fractions are pushed out of the top of the bowl at different levels, from which they are collected and run off into stainless steel receptacles. At this point a high-speed pump transfers the hot, crude oil into a clarifier which, applying the same principle of centrifugal force, separates any stray water which may have been thrown over in the first separation from the pure oil. From the clarifier the oil, sparkling clear, is run directly into a clean 44 gal. drum, into which, after a sample is taken for testing, an injection of nitrogen is made and the container sealed for storage.

In the present stage of vitamin oil development the heavier constituents have no definite value, but they may yet reveal properties even more valuable than the oil.



The spectrophotometer, used in the second test for vitamin A potency, is housed in a specially air-conditioned dark room.

Refining and Blending

Samples of each extraction are sent immediately to the laboratories, and the crude oil is then stored under nitrogen in readiness for refining and blending. Refining methods involve a high degree of technical skill in the use of freezing and other equipment and take anything up to three weeks to complete. Nothing can be left to chance at this all-important stage, and the difficult task of finally clearing the oil of saponifiable matter has been achieved only after long experimentation.

The blending and standardising of the oils call for special apparatus and methods, involving in some cases a conditioning temperature of −30° C.

Tests for Vitamin A Potency

The complete test covers vitamin A potency in duplicate on Beckmann and Hilger spectrophotometers, colour of oil in Lovibond units, saponification value, iodine value, peroxide value, and acid value, the resultant oils ranging in concentration from 500 International Units of vitamin A per gramme up to 400,000 I.U. per gramme.

The more highly concentrated oils are especially suitable for medical treatment and for the fortification of margarine, chocolate, and other foods. A comparison with cod liver oil will illustrate the potency of the oils:

	Content per Gramme.	
	Vitamin A.	*Vitamin D.*
Cod liver oil	850	100
Greenwell's Hexacod ..	5,000	500
Greenwell's Adeol ..	25,000	2,500

A process for eliminating stearin from the oils, ensuring a sparkling clearness under any conditions, has also been perfected, while the molecular still has been in operation for twelve months.

Material and Production

The Greenwell factory produces oils from the livers of swordfish, hapuka, kawhai, shark, dogfish, ling, bass, elephant fish, and kingfish. The 1944 production of 12,000 gal. of concentrated oil represents a cod liver oil equivalent of 240,000 gal., and these oils, with a higher than average vitamin potency, enjoy a reputation for quality that is widely acknowledged in overseas markets.

The future of the fish liver oil industry in New Zealand is bright. In relation to medicine and nutrition alone there are still greater benefits yet to be made available. Beyond this field there is the immense range of technical uses for the oils, which can be employed in the manufacture of paints and varnishes, floor coverings and waterproof fabrics, in printing inks and rubber goods, in soaps, lubricants, insecticides, and many other branches of manufacture.

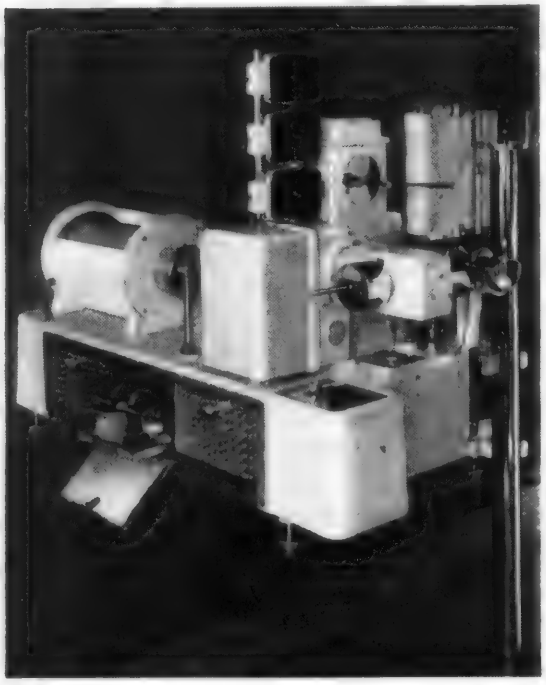
The Chemist in the Flour Mill

The view is sometimes held that the flour mill chemist's field is a narrow one, but his true role is to combine purely scientific ideas with commercial practice. In his paper Dr. C. W. Herd develops this theme.

THE flour mill chemist is not a miller and he is not a baker, but he must have intimate knowledge of both these industries if he is to do his job properly. The chemist must not be tied to his laboratory, but should spend most of his time outside on advisory work.

Routine work covers the examination of raw materials, which means a study of the wheats arriving at the mill. In normal times wheats are received in this country from all over the world; these wheats vary in their characteristics, and full knowledge of the characteristics is necessary to the miller. Wheats are blended to give a balanced mixture, so that the deficiencies of one wheat may be counterbalanced by the properties of other wheats. The routine examination of the wheat involves the determination of moisture, protein, and diastatic activity.

Moisture testing is of great importance. There is an optimum moisture content for the best milling condition of all wheats, and every wheat has to be treated in the mill to bring it into this optimum condition. Thus English wheats frequently have to be dried, whereas many foreign wheats need the addition of moisture, which is done by a process known as conditioning. This process not only adds water but alters the physical condition of the grain so as to enhance its milling quality. The protein content of the wheat is perhaps its most important property; high protein wheat is preferable, although the quality of the protein is probably of even greater importance. The starchy wheats are generally of poorer protein quality than the vitreous wheats, and the mill mixture in this country consists of a blend of both types. In order to measure the protein quality of wheat it is necessary to convert it into flour in an experimental mill, dealing with a few pounds of wheat. The aim in experimental milling should be to produce a flour of the same extraction and of the same properties as that from the commercial mill, but this is not yet achieved by any of the experimental mills available. When this can be done the laboratory will be able to give the miller an exact picture of the quality of all the wheats received at the mill.



The Brabendor Extensometer.

Wheats are blended by the miller to give him the flour with the characteristics required by his trade; the chief factors considered in making this blend are protein quantity, protein quality, water absorption in the dough, gassing power, and colour.

The protein and gassing power are determined chemically, while the protein quality and water absorption are obtained from the physical dough properties determinations. Colour is a characteristic of each wheat, and wheats of different origins have accepted colour contributory values. However, the wheats change from year to year within certain limits, and the chemist must examine each new crop every year and advise the miller as to the value of each in the mix.

The Milling Process

Chemical control consists in the checking of the total moisture content of the wheat after the conditioning process, and also the distribution of moisture throughout the grain. The application of heat in the conditioner needs attention; in a radiator type of conditioner a gradation of temperature in the different sections needs consideration, while in the hot-air type of conditioner attention has to be given to the temperature gradient between the air and the grain. Recent work by milling engineers

has resulted in the introduction of a new machine, which immerses the hot wheat from the conditioner into cold water, with the object of assisting the separation of the bran.

The breaking process is the first opening of the grain to release the endosperm, and then the scraping of the bran; little scientific work has been done on this, but it is the duty of the chemist to examine each of the break rolls and to determine its production of coarse semolina, medium semolina, fine semolina, dusts, and flour, and furthermore how much bran powder is produced. The fluting of the rolls and the setting of the rolls, which are controlled by the miller, must involve investigation by the chemist, because the setting is done by feel, and different operators may give very different settings. Actually on one occasion the difference in stock to be dealt with subsequently was 500 lb. Such variations destroy regularity in the mill. Mill foremen use a hand-sieving method to guide them, but variations in such sieving can be very large; a mechanical sifter should be used in the laboratory and the results on each commercial machine must be standardised. In due course much greater regularity in the mill can be attained and the working of the mill machines can be satisfactorily stabilised.

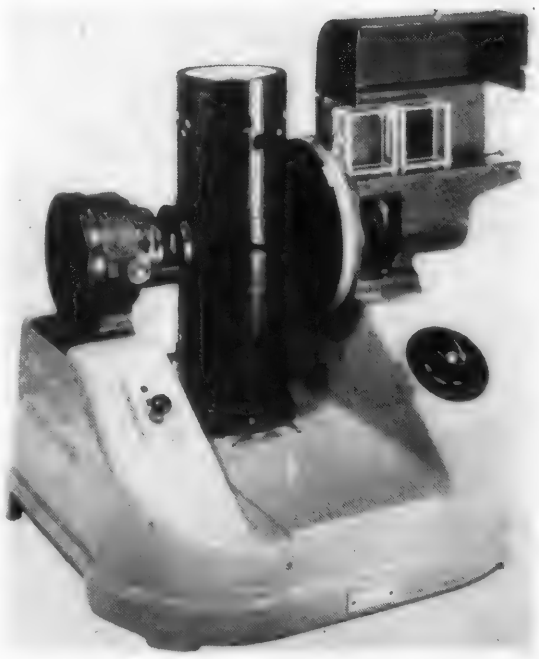
The dressing machines again suffer the faults of irregularity, with subsequent uncontrolled variations further down the mill. The work of these dressing or sieving machines can again be checked by the standard laboratory sifter. This is just as important as the control of the working of the rolls, and the laboratory influence in the mill can gradually be strengthened with increasing confidence in the laboratory and the chemist.

Danger of Infestation

Wherever there are cereals or cereal products there will be danger of infestation. Methods of control, methods of fumigation of wheat, screenroom, mill, and warehouse must be fully studied and check constantly made on the necessity for and the efficiency of fumigation. Every mill should be fumigated at least once a year, the concentration of gas to be used and the nature of the gas coming within the purview of the laboratory.

Much attention has been given recently in the U.S.A. to the cleanliness of milled products. A new test for insect fragments and rodent excreta has been designed; originally called the "filth test," it is now referred to as micro-analytical technique. In the test referred to, the starch is broken down and the foreign material is oil-floated off, separated, examined, and counted under the microscope. If any manufactured cereal goods are sent abroad it is probable that this test might be applied, and it would be advisable to adopt it.

For the examination of the finished products the laboratory should have a constant temperature physical dough testing room and a bakehouse for



The Fluorimeter.

the complete examination of the mill products. The chemical examination will cover moisture, protein, diastatic activity, ash, colour, vitamin content (principally B_1), and other nutrient factors.

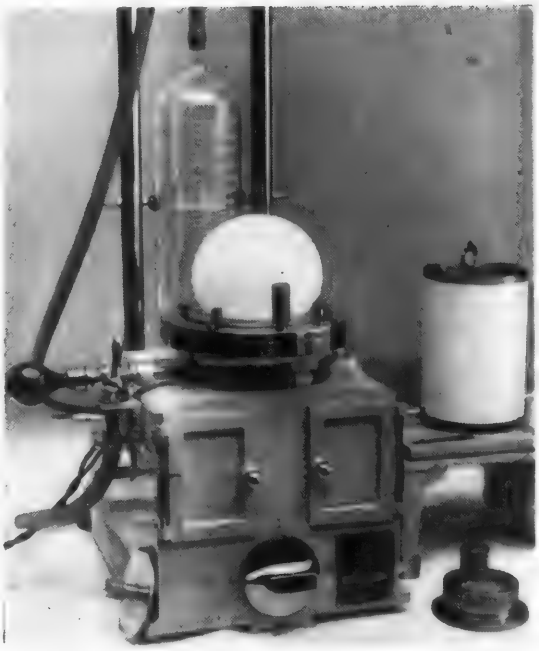
Use of Improvers

Flours are frequently bleached, and the control of regularity of the bleaching apparatus must rest with the laboratory; gases which have been used for this purpose are nitrogen oxides, chlorine, nitrogen trichloride, and the solid compound benzoyl peroxide. The bleaching action takes place on the carotenoid compounds in the flour, and apart from measuring the depth of the extracted colouring matter the chemist must be prepared to determine the residual chlorine or benzoyl group in the flour.

The use of improvers is also common practice in milling; these may be joint bleachers/improvers like nitrogen trichloride, or consist of a powder addition which only has an improving action on the dough properties. Such powders have ammonium persulphate or potassium bromate as their active ingredients. The regularity of these additions must be checked and controlled.

The physical characteristics of the dough are perhaps the most important factors in flour or dough quality. There are numerous machines, acting on different principles, which are in fairly wide use today.

The German Brabender machines are probably most widely used; these consist of the Farinograph



The Chopin Alveograph.

and the Extensograph. The Farinograph measures the mixing properties of a dough, giving information on water absorption, mixing tolerance, and behaviour after optimum mixing. The Extensograph is perhaps the more important machine of the two, and records the behaviour of the dough during fermentation and moulding. It will show the condition of the dough on making and the changes which take place during fermentation. The curves will also indicate the effect on the dough of the addition of improvers. The terms used are resistance and spring, measured by the height and length of the curve. By comparison of these curve characteristics and the actual dough properties, useful information is obtained, and eventually it will be possible to predict dough behaviour from a study of the Extensograph curve.

Another machine which has achieved some popularity is the French Chopin Alveograph. This operates on a different principle: the dough is made with constant amount of water, and discs of dough are blown into bubbles by air pressure, the behaviour of the bubble to bursting point being recorded. The height and length of the curve are measured, and from them are calculated the dough properties in terms of stability, extensibility, and general strength, an overall figure to give a general representation of quality.

The bakehouse is a fundamental part of the testing equipment; the baking test is the final and definite criterion of the flour's quality. The judgment of a flour today is based on the dough behaviour and character of the final loaf. The chemist may have a test baker on his staff, but whether he does or not, he should frequently do his own baking tests.

Another physical test of great importance concerns the particle size or granularity of the flour; this affects the baking behaviour of the flour and also the dressing of the flour in the dressing machines. The miller measures this in a sieve, which gives the limiting sizes of the particles, whereas the chemist uses Stoke's Law and applies the sedimentation method, by which he can determine the distribution of the particles of all sizes within a given flour stream.

The main side-line of flour milling—provender milling and the animal feedingstuffs—is at present under strict control, but when freedom returns it will be necessary to work out formulae of balanced rations for different classes of livestock, to prepare necessary mixtures for cubing, and to see that products meet the specification given for each product and fulfil the requirements of the Fertiliser and Feedingstuffs Act.

Milling for a High Vitamin Content

The milling process itself has not yet been investigated in any detail, and it is suggested that much valuable work could be done on the breaking process and on the dressing characteristics of wheats and flours, to say nothing of the scope in the field of conditioning of wheat. Although this process has been the subject of much investigational work, every miller still has his own ideas about it. The true effects of the different processes—radiator, hot air, and vacuum types—should be determined. Coupled with these problems is the now very important one of milling for a high vitamin content. Can the scutellum be separated or can greater concentration of the scutellum be obtained in certain streams? Can a really white flour be milled with a high vitamin content? Will the policy be for a continued 85 per cent. extraction flour or will the extraction rate be freed and some form of fortification be allowed? The milling and the fortification standpoint must be studied—the methods adopted in U.S.A., and the difficulties to be met in applying and enforcing them in this country. The chemist must be prepared to advise the industry and the Government on the advisability of either process, and must be prepared for either eventuality.

The function of trace elements in human and animal nutrition is allied to the above considerations; little progress has as yet been made in this problem, but the flour mill chemist must take a hand in this because cereals, and particularly flour, play such an important part in the diet of the human race in the Western Hemisphere.

Abstract of a paper presented by Dr. C. W. Herd to the London and South-Eastern Counties Section of the Royal Institute of Chemistry.

Automatic Control in Food Processing

Part II

IFO WALTER, Dipl. Engr.

Temperature Control

FIG. 1 shows a hot liquid tank, which may be representative of a great number of process tanks, having open steam injection for heating. Mode of control will depend on storage volume and whether it is a boiling-up process or whether there is draw-off. Mode of control can be on/off with small temperature differential which should be adjustable, or a narrow-band controller type could be used having gradual proportional control. Three alternative positions are shown for the thermostat bulb which has to be immersed where it can detect average temperature and where it remains fully submerged. It is usual to fit the control valve in a by-pass to the steam supply line to facilitate servicing of the valve, during which time hand control can be applied.

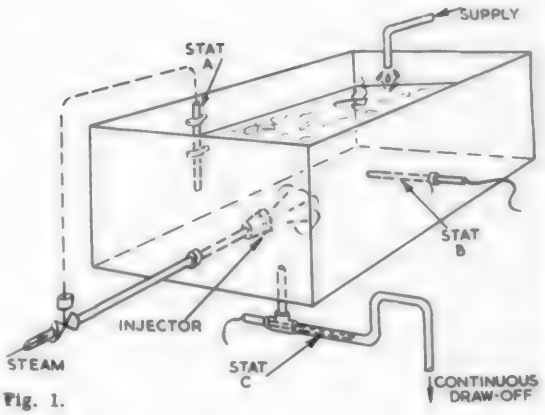


Fig. 1.

Fig. 2 illustrates a closed pressure vessel, which may be a steam or hot-water-heated calorifier or a brine cooler. A pneumatically operated temperature regulator is shown, using proportional-plus floating control. Self-actuated controllers may also be used, having proportional control. Heating calorifiers always use gradual control, but hot water supply calorifiers with intermittent draw-off are better with the on/off mode of control.

For small jacketed heating vessels a thermostatic circulator-steam-injector can be used, which continuously draws in cooler water from the jacket and heats it up. Steam admission is controlled by a small liquid-filled thermostat within the body, which throttles down steam admixture as required.

Controlled Drying Rate

The basic question for hot air drying in a drying apparatus is whether it is intended to control the rate of drying or whether it is intended to control hot air temperature within the drier. Controlled drying rate allows variations of temperature within the drying space, and the thermostat will be placed in or near the exhaust air outlet. Location of the stat within the drier produces constant air temperature, which does not influence rate of drying. Fig. 3 shows a compartment drier using fan circulation of air, and the thermostat bulb controls rate of drying. Control of hot air drying apparatus is a specialised job, and often combined temperature and humidity control is desirable. For smaller batch driers, semi-automatic control is usual, whereby air dampers are adjusted by hand, but steam admission is controlled from an automatic regulating valve with thermostat. Large conveyor driers need pneumatic controllers, using reset mode of control.

Fig. 4 illustrates one type of exhauster box as used in canning, and the thermostat bulb of a pneumatic controller is placed in the water bath. Where load fluctuates, reset mode of control has to be used. A pneumatic recorder-controller for regulating steam admission to pea or bean blanchers is also useful. The running load is small, because water inflow may only be in the region of 30 gal. per hour, and heat is only required to make up for heat losses from the surface of apparatus and for heating up the small volume of cold make-up water.

Temperature control of hot air is required for fish curing kilns, where a steam-heated air heater battery and the air mixing damper are automatic-

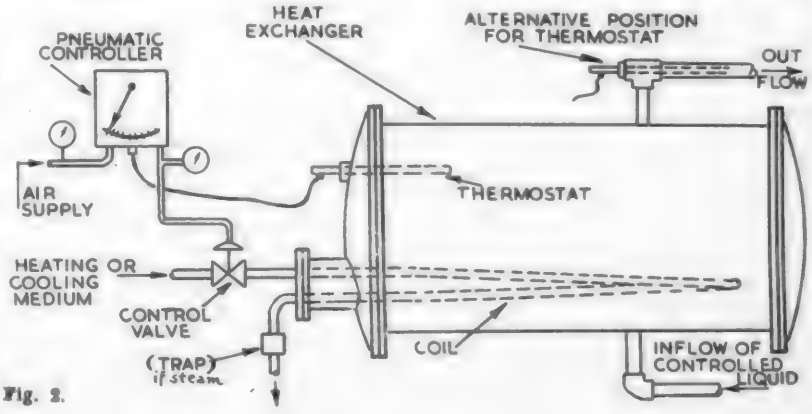


Fig. 2.

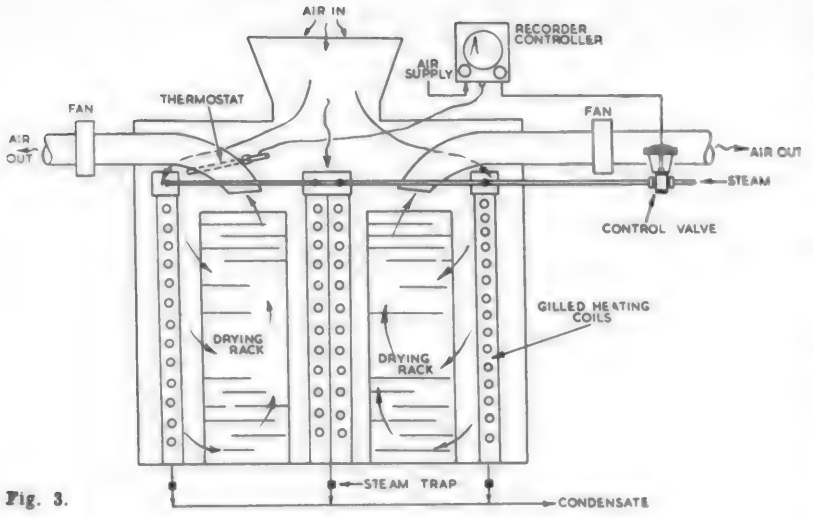


Fig. 3.

ally controlled from electro-hydraulic regulators. With rise of kiln temperature the steam admission to the heater is closed down progressively and humidity is also gradually controlled by adjustment of recirculation of air. This scheme includes many layout characteristics of automatic control of air conditioning plants. Automatic control of food retorts varies from simple layouts to very elaborate control systems, whereby temperature, pressure, cooling, and heating are controlled following a predetermined time schedule. Fig. 5 shows a simpler layout of a cooking retort control system. For programme control, pneumatic recorder-controllers, with cam attachment, are being widely used for performing the timing of operations.

Pressure Control

Automatic pressure switches for motor starters of pumps, fans, etc., are widely used in the food industry. High-low pressure switches are used for air receivers of compressors. The ordinary steam reducing valve is often installed where load varies in the upstream side, and great accuracy of control cannot be expected. Pilot-operated self-actuating pressure regulators, or pneumatically controlled instruments, must be used where greater accuracy is desired and for control of vacuum at close limits. Whether proportional-plus floating, or reset mode of control, should be used depends entirely on working conditions. All pressure control problems have small time lags and need speedy control action.

It is sometimes preferable to control temperature of steam by keeping its pressure steady. For example, steam pressure controllers are being used for controlling temperature of cylinder surface of roller driers using saturated steam.

Rate of Flow Control

The usual way of controlling rate of flow is to place an orifice into the pipeline carrying the fluid to be controlled, thus creating a pressure differential which can be used for measurement and control. Pumping of liquids provides the most widely encountered problems of automatic flow control, and pneumatic controller types are usually employed, having from proportional to stabilised mode. An interesting problem is ratio control, whereby flow in one pipe is controlled in strict ratio to flow in a second pipeline. A pneumatic controller measures rate of flow in the primary pipe, and conveys impulses to the controller in the secondary pipe, which produces constant flow ratio as desired.

Ball float valves, or electric flow switches, are widely used for liquid level control, although they are not always the best methods for achieving accuracy. Displacer control methods produce very fine control near the desired level. Cam-actuated lever mechanisms produce the same effect by speeding up inflow if level is low, but retard inflow when level rises near the desired control point. Separate float cages are often used on large storage tanks for providing pneumatic control, and a float

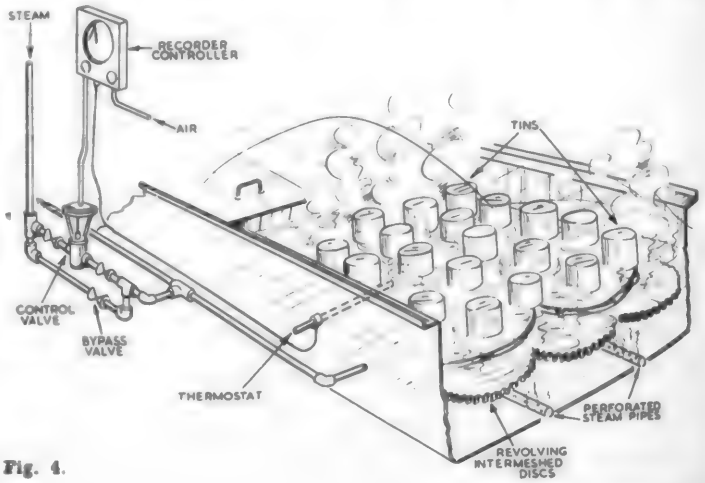


Fig. 4.

cylinder actuates one or more tilting mercury tubes, which actuate motor starter and relays and provide on/off control. Nearly all measuring instruments using pressure heads as measuring means for liquid level can be utilised for control purposes, and differential-pressure instruments are used for controlling liquid level in a closed vessel.

It is important for the plant engineer to understand fully on which basis a control valve has to be dimensioned by the control specialist, because he has to supply data. It is well known that the size of a control valve differs from pipe diameter. It should be emphasised, however, that methods of sizing of control valves and pipes are different. An oversized on/off valve would have too frequent opening and closing actions, and heat input, for example, might be too violent during on-periods. Even more important is to see that a gradually controlling valve throttles correctly. The rule is that a throttling regulating valve must have the smallest aperture in the whole supply pipeline carrying the control medium. For temperature control, it is customary to choose a pressure drop across the fully open control valve according to process characteristics and experience, and to base the valve size on this pressure drop. Valve capacity depends entirely on the difference of pressure between inlet and outlet of a control valve, all other factors being equal. For temperature control or pressure control of steam, the valve size is usually one or even more sizes smaller than the pipe diameter if the steam supply pipe has been generously dimensioned to compensate for friction losses in the supply pipe. A control valve, having the same diameter, would be grossly oversized. Whether the pressure drop for valve sizing should be 10 or 20 or 50 per cent. of the inlet steam pressure depends entirely on working conditions. Makers of control valves supply tables or graphs for the convenience of users, but they should only be used for rough estimates, and the final size of valve should be worked out by co-operation between plant engineer and control engineer.

BIBLIOGRAPHY

The Instrument Manual, 1948. Section on "Automatic Control" by L. Walter and L. B. Lambert.

The A B C of Temperature Control, 1947. Sarco Thermostats, Ltd.

Instruments and Process Control, 1947. Cornell University.

Industrial Instruments for Measurement and Control. Th. J. Rhodes.

Principles of Industrial Process Control. D. P. Eckman.

The Industrial Heating Engineer. Fundamentals of Temperature Control. L. Walter.

Application of Temperature Controllers. ASME Transactions, November, 1938. Haigler.

Bakery Research

ENCOURAGING progress in the expansion and growth of the facilities of the British Baking Industries Research Association is announced in their second annual report for the year ending June 30, 1948, issued by the Council. The results of some of the scientific investigations already in progress in the research laboratories and at the Royal Technical College, Glasgow, have been published in the bulletins of the Association and in research reports.

The facilities of the analytical laboratories are being extensively used by members seeking advice on their current problems, particularly on the suitability of raw materials, and close co-operation exists between the experimental bakery and the senior research and analytical chemists.

The analytical laboratory is undergoing expansion to meet the heavy demand on its services, and bacteriological facilities will soon be available.

Mr. R. T. Colgate, chairman, in the report of the Council, mentions that the balance of income over expenditure carried forward from the first annual report, together with a substantial proportion of the current year's revenue, has been used for capital expenditure. It was deemed necessary to call on the Research Foundation Fund for only £2,000, which, with the further £2,000 of Government grant which this earned, enabled the Association to complete the financial year with reasonable cash resources.

A comprehensive research programme has been drawn up for 1948-1949, and will deal with such topics as anti-staling agents, the effect of ultrasonic vibrations on dough stability, batter stabilities in cake making, albumen substitutes in flour confectionery, etc.

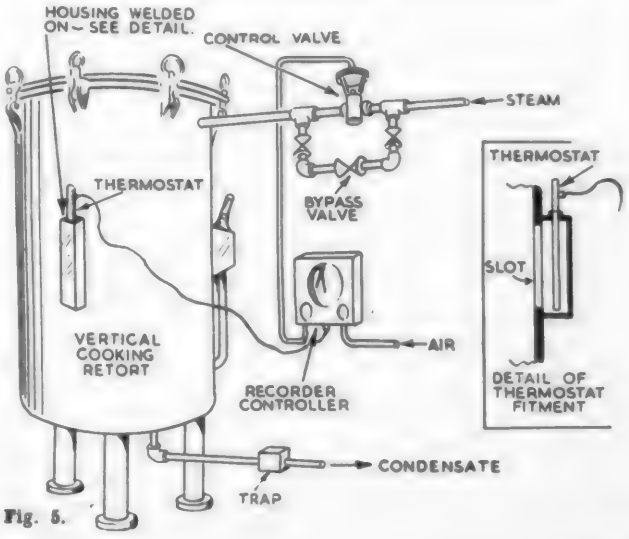


Fig. 5.

Dairy Bacteriology

THE number of textbooks on dairy bacteriology in the English tongue is so small that a new edition of one of them is an important event in the world of dairy science. Prof. Hammer's position in dairy bacteriology and his own well-known contributions to this science make the appearance of the third edition of his work* doubly welcome. The new edition runs to nearly 600 pages and deals with general bacteriological tests, fermentations occurring in milk, the control of milk contamination (or clean milk production and distribution), bacteriological aspects of filtration, clarification and separation (a subject too often overlooked), enzymes, public health aspects, milk products, and dairy water supplies.

The book is written primarily for American readers and consists of a most competent survey of American workers' contributions to dairy bacteriology, with occasional references to British and Continental work. It is of interest to note that no really international work on dairy bacteriology has ever appeared, the only other comparable book in English having an equally marked Scandinavian bias. Both works are, in consequence, of interest to British readers chiefly as books of reference about dairy bacteriology in America and Scandinavia respectively. Nevertheless, the fundamental principles are true for all countries, and Hammer's book is a rich source of information in this respect. The few illustrations in the book are excellent for their purpose and it is a pity that more have not been included.

Bacteria in Milk

In his comparison of the common methods for the assessment of bacteria in milk there is a difference of viewpoint from that in this country, where milks are examined for pathogens by special enrichment methods, and the plate count is used as a criterion for total numbers and especially as an index of methods of production and handling. It is not our practice to link the plate count with disease aspects, and even if a rapid and accurate method for determining pathogens were ever devised it would not replace the routine plate count, which is an invaluable tool for dairy bacteriologists acquainted with its limitations. The advantages of the direct microscopic count are well set out, and this test could with advantage be more often used in this country.

The bacterial standards in U.S.A. are of the greatest interest to us, but plate count figures are of little value unless the age of the milk and the conditions of sampling and treating the sample are rigidly defined. This latter point is not yet properly appreciated in this country and undoubtedly accounts for the frequent discrepancies between test results obtained by local authorities and the dairy control laboratories. This holds irrespective of the test used and in the reviewer's opinion the problem may prove to be so great that we shall ultimately abandon all attempts to lay down bacteriological standards for consumer milk and rely on phosphatase and keeping quality tests.

Although the author refers to the official manuals for standard methods, the formulae for the more important media might well be given, especially as reference is made later to the effect of specific constituents in the media. The media quoted for research purposes are drawn from a restricted field and the help given to the student on technique is practically nil. It is true that the author assumes a knowledge of elementary bacteriology, but normally one expects some information on technique in a textbook.

The public health aspects are very scantily dealt with and are not very critical. For example, it is mentioned that methods of examination for certain pathogens, notably *M. tuberculosis* and *Brucella*, give accurate results. This is a statement needing some qualification since, while a positive properly confirmed may be accepted as a true positive, a negative finding does not prove the absence of the organisms concerned.

Milk Fermentations

The chapter on milk fermentations is a useful *résumé* of the subject, but the discussion of initial acidities in cow's milk might mislead the student, since these are quite unrelated to fermentation. Classification is only lightly referred to, and not all bacteriologists will agree that the source of an organism should be taken into consideration in its classification. Ropiness is thoroughly discussed, but it is doubtful if it is wise to include abnormal flavours of non-bacterial origin in a chapter on fermentations and it is perhaps not quite accurate to refer to colour fermentations.

The chapter on contamination is a useful survey of the bacteriological principles underlying clean milk production. The following chapter is of special interest, since data on filtration, clarification, and separation are not generally available.

The enzymes of milk are surveyed in a concise way and the matter on abnormal flavours of non-bacterial origin would have been better placed in this chapter.

Milk-borne infections and pasteurisation are amply covered, but it is the chapters on milk pro

* *Dairy Bacteriology*. By B. W. Hammer, Ph.D. Third Ed. Pp. 593+viii. London and New York. Price 36s.

ducts, and especially those on lactic acid cultures (starters) and butter, which give the book its real worth. Here Prof. Hammer speaks with the authority of a lifetime's experience which probably no one else in the world can equal. The section on defects in butter is the best survey on the subject available.

The reader should bear in mind when reading the chapter on cheese that the types quoted are American, although they bear foreign names.

Dairy water supplies are dealt with in a final chapter which rounds off a classic textbook on the subject.

Summing up, the work is essentially practical in outlook and provides a valuable handbook to the dairy technologist, especially in the fields of butter and other manufactured products. The British worker will find it useful particularly for the last-named purpose, but he should remember that American conditions are not always quite the same as those in the United Kingdom. The book can be strongly recommended for all dairy laboratories, particularly those in manufacturing creameries.—J. G. D.

Food in the Faroes

It is always interesting to hear how communities maintain their food economy when geographical and climatic conditions enforce some alternative to normal agriculture. Of such communities are the people of the Faroe Islands; they ensured three-quarters of our fish supplies in those grim days of 1940-1941, despite the bombing and machine-gunning of their fishermen. The Faroes are volcanic, standing sheer out of rough seas; the soil fit for agriculture thus lies in narrow strips difficult to plough, with any "corn" harvested having to be artificially dried in special kilns.

In a well-illustrated book* the full story is told of how these hardy folk, far from showing a diminishing population curve like those of the Hebrides, have greatly increased their numbers and yet maintained food supplies. The answer lies in the provision by the sea of a harvest to supplement the meagre yields from land. Apart from hay there is a hardy six-rowed barley, still green and far from ripe in the September "fields," yet one which is dried and milled with care. There are no landlords among owner-peasants; grazing grounds are communal affairs. Turning to meat supplies, the island sheep, cropping whatever greenery can be found, is like the Chicago canner's pig; nothing is wasted except the bleat (instead of the squeal), with even the intestines going into sausage. Dried mutton like biltong, after hanging in outhouses for months, is served up with such a powerful flavour and odour that the author regretted the lavish hospitality of the Faroese—particularly when the mutton, dark red and raw, had turned into a toffee consistency! More to our liking would be the dozen different kinds of cakes and biscuits, chocolate and cream, served at afternoon "tea," where the drink is usually coffee. And there are special days with cream and buttermilk in liberal supply, or with wild angelica compounded with cream and sugar. One of the "milk pudding" days comes on the last day of summer; eat it as hot as possible and you will enjoy a warm winter, or so they believe.

From the sea the harvest is bounteous. Among sea birds making up for moderate meat supplies are 500,000 puffins a year (many salted for the winter), which ensure for a "Lundi" lunch two birds each, with a good helping of potatoes. There are 100,000 young fulmars, innumerable gannets, guillemots and razorbills, and thousands of eggs per week, yet one hears nothing of diminishing bird populations. If anyone fancies puffin and potatoes with rhubarb or strawberry jam sauce, or roast razorbill stuffed with a pudding of currants and raisins, the Faroes is the place for him. But if he has a queasy stomach, he should not stay for the whaling—for the *grindadrap*, at which a *grind* or school of Caaing whales is driven into a narrow harbour by hunting, shouting, stone-throwing, and a cordon of boats. The whirling mass of whales becomes partly driven ashore in confusion, while the rest are despatched with bill-hooks and harpoons until the sea is crimson.—M. S.

* *The Atlantic Islands*. By Kenneth Williamson. Pp. 360. London. 16s. net.

Advice to Bakers

The conditions under which home-grown wheat was harvested this year have resulted in some National Flour having a high maltose figure. To help bakers to produce good-quality bread from all present-day flours, the Ministry of Food offers the following advice:

1. The water absorption of the flour should be carefully watched, as it is important that the dough is neither tight nor slack at scaling. An absorption of 14½ to 15 gal. per sack is suitable for most flours when given 2 to 3 hours' bulk fermentation.
2. Salt should be used at the rate of 4 to 5 lb. per sack, as this helps to stabilise the dough.
3. Malt preparations should not be used while the flour has a high maltose value.
4. Hot doughs should be avoided. Cool doughs made with sufficient yeast to give proper fermentation are recommended. Green doughs result in small dense loaves which are difficult to bake out. A bulk fermentation of 2 to 3 hours is generally best.
5. Excessive proof which may lead to an open crumb should be avoided. Slight underproofing is advisable with present-day doughs.
6. Cool ovens should be avoided. A solid heat helps to minimise a loose crumb. The oven should not be overloaded, but the loaves spaced so that they get a better chance of thorough cooking, which will minimise doughy crumbs.

News from the Industry

FORTHCOMING EVENTS

Royal Sanitary Institute

The following meetings have been arranged by the Royal Sanitary Institute:

Plymouth Sessional Meeting. December 3, at 10 a.m., in the Art Gallery, Tavistock Road, Plymouth. Papers on "Re-planning of Plymouth," by J. Paton Watson, C.B.E., M.I.C.E., City Engineer, Plymouth, and "Age and its Problems," by W. G. Lock, Deputy Chief Sanitary Inspector, Plymouth. In the afternoon visits will be paid to housing estates, community centre, converted clinic, port health department, and marine biological laboratory. Chairman: Sir Weldon Dalrymple-Champneys, Bt., D.M., F.R.C.P. (Chairman of Council).

London Sessional Meeting. December 8, at 2.30 p.m., at the Institute. Discussion on "Food Hygiene: Ideas for the Future," to be opened by Councillor William L. Roots, Barrister-at-Law, Chairman of the Public Health Committee, Kensington, and H. W. Walters, Chief Sanitary Inspector, Kensington. Chairman: Sir Weldon Dalrymple-Champneys, Bt., D.M., F.R.C.P. (Chairman of Council).

Society of Chemical Industry

Meetings arranged by the Agriculture Group of the Society of Chemical Industry for the first part of 1949 are as follows:

Jan. 18. Joint meeting with the Chemical Engineering Group. "Granulation of Compound Fertilisers: Some Current Production Problems and Developments." Mr. J. W. Steventon and Mr. K. A. Sherwin (Fisons, Ltd., Ipswich). 5.30 p.m. at the Geological Society, Burlington House.

Jan. 19. Joint meeting with the Newcastle Section. "Moorland Pastures: Their Contribution to Animal Nutrition." Mr. Brynmor Thomas, University Department of Agriculture, Newcastle. 6.30 p.m. in the Chemistry Department, King's College, Newcastle.

Feb. 10. Joint meeting with the Nottingham Section. Short symposium with demonstrations on "Plant Diseases, including Pests, Deficiencies, and Viruses." 7.15 p.m. in the Nottingham Technical College, Shakespeare Street, Nottingham.

Feb. 15. Joint meeting with the Society of Public Analysts, Biological Methods Group. Short symposium on "The Evaluation of Selective Weed-killers." Introduced by Dr. M. A. H. Tincker. 2.30 p.m. in the Chemistry Department of the Royal College of Science.

Mar. 15. "Manuring and Crop Production, with Special Reference to Fertiliser Placement." Dr. A. B. Stewart, Macaulay Institute for Soil Research. "Apparatus for Fertiliser Placement Field Work; Results of Experiments on Potatoes." Dr. G. W. Cooke, Rothamsted Experimental Station. 2.30 p.m. in the Chemistry Department of the Royal College of Science.

Meetings for the London section are as follows:

Dec. 6. "Application of Radio-Active Elements in Industry." Dr. H. Seligman. 6.30 p.m. at the London School of Hygiene and Tropical Medicine.

Dec. 14. Joint meeting with the Agriculture and Food Groups. "World Cereals Today." Mr. C. A. Loombe. 5.30 p.m. in the Chemistry Department, Royal College of Science.

1949.

Jan. 3. "The Manufacture and Uses of Carbon." Dr. H. K. Cameron, B.Sc., F.R.I.C. 6.30 p.m. at the London School of Hygiene and Tropical Medicine.

Institution of Works Managers

The 1949 programme of the London branch of the Institution of Works Managers commences with the following meetings:

Jan. 20. "Modern Lighting in a Factory." J. Aldington (Siemens Ltd.).

Feb. 24. "Statistical Methods and Production." B. P. Dudding (G.E.C., Ltd.).

Mar. 21. "The Factories Act." T. H. Threlkeld, H. M. Superintending Inspector of Factories.

Apr. 12. Half-day conference. "How the Money Moves in a Business." T. G. Rose.

Apr. 26. "The Development of Welfare in a Small Factory." W. H. Bower (Industrial Welfare Society).

May 18. "Running the Small Factory." A. H. Huckle (K. and L. Foundries, Ltd.).

All the meetings will be held at the Waldorf Hotel at 6.45 p.m. with the exception of the half-day conference on April 12, which will commence at 12.30 p.m.

— —

Ideal Home Exhibition, 1949

The twenty-sixth Daily Mail Ideal Home Exhibition will be held at Olympia from March 1 to March 26, 1949.

Weights and Measures

COMMITTEE TO REVIEW LEGISLATION

A committee has been appointed by the President of the Board of Trade to review the existing legislation on Weights and Measures and the administration of these laws, and to make recommendations for bringing these into line with present-day requirements. The committee is likely to consider, among other things, the best methods of administering the Weights and Measures legislation, the suitability of existing fundamental standards, and the need for the compulsory verification of a number of weighing and measuring appliances which have come into use since the last legislation was passed. The committee will also examine whether certain present provisions should be extended to cover a wider range of commodities and to apply to the wholesale trade as well as retail.

The committee will be under the chairmanship of Sir Edward Hodgson, K.B.E., C.B., a former Second Secretary of the Board of Trade, and its members will be drawn from the manufacturing, wholesaling, and retailing trades and from the consuming public, as well as from the scientific world and from those who have had experience in administering the existing laws. The subject is complex, and the committee, which will hold its first meeting in the near future, will be inviting the many interested bodies to submit evidence. The enquiry is, therefore, likely to last for at least a year, after which consideration will be given to the introduction of such new legislation as the committee may recommend.

Cake and Biscuit Industries

Opportunities given for consultation with the Ministry of Food through the Food Industries Council have encouraged the executive committee of the British Cake and Biscuit Association in the hope expressed in their report for the year ended May 31, 1948, that the end of war-time control in the two industries may not be too far distant.

Success again marked the annual conference held earlier this year, and it is hoped to hold another conference in 1949. This year's conference brought to light the desirability of an Association symbol, and one has now been adopted. Subscription to the Federation of British Industries, which the committee joined as an experiment in 1947, has been renewed, and a detailed report of the Federation's activities, in so far as they affect the cake and biscuit industries, is to be submitted to members. As formerly indicated, the committee has been concerned with the lack of uniformity of costings in both industries, and has now evolved a model costing plan for each industry which could be followed by manufacturers. Endeavours to secure unity in the flour confectionery industry have been unsuccessful, and it is also reported that differences between employers and operatives on the subject of night baking have not yet been resolved.

In addition to an account of the committee's contacts with kindred associations, the handbook includes reports of recent developments with regard to wages and conditions, the work of the National Board for Bakery Education, the question of prices, export, census of production, legislation, unemployment, and development areas, and standards in the baking industry.

Change of Address

The address of the British Food Machinery Manufacturers' Association is now 14, Suffolk Street, London, S.W. 1. Telephone: Whitehall 0766.

Design at Work

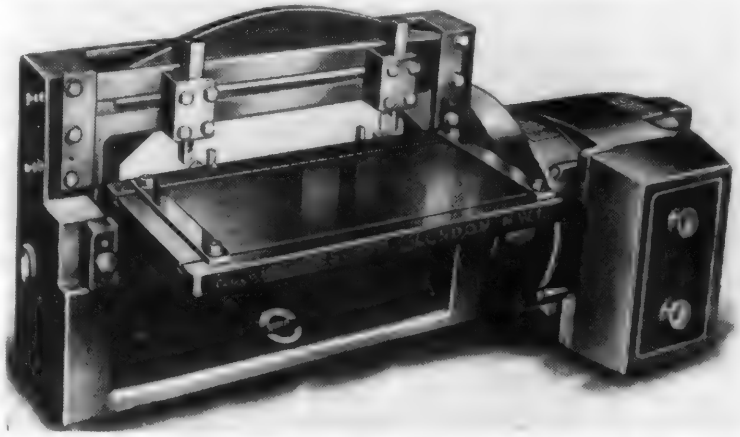
AN EXHIBITION OF INDUSTRIAL DESIGN

A hope that the exhibition would bring out clearly and convincingly the close relationship there should be between production and design, and the great possibilities and advantages from their union, was expressed by the Lord President of the Council, the Rt. Hon. Herbert Morrison, P.C., M.P., when he spoke about the "Design at Work" exhibition, organised jointly by the Royal Society of Arts and the Council of Industrial Design, which was opened by H.R.H. the Duchess of Kent at the Royal Academy on October 26.

The exhibition, which was the first of the work of the Royal Designers for Industry, was intended as a forerunner to the centenary of the Great Exhibition of 1851, and was meant to stimulate the production of British goods of outstanding design in time for showing during this festival.

The first section of the exhibition explained the meaning of design—the shaping of things to fit the purpose for which they are made, the material from which they are made, and the process followed, but above all the making of things that people needed. By means of actual objects, photographs and dioramas, the various stages in the creation of some familiar products, as well as of some new designs, were shown. The designer could be seen in active relationship with other members of the production team, from the preparation of his initial sketches, through discussions with the production and works' staffs, the building of prototypes, the making of modifications, the preparation of working drawings, the tooling-up of the machines, to the ultimate manufacture of the finished product.

In appropriate case histories, references to the effect of materials and techniques on the shape of everyday things, as well as the effect of social conditions, architecture, handicrafts, history, and tradition, were included.



Double Ended Notching Machine

A machine suitable for notching both ends of tin box body blanks simultaneously or notching one end and slotting the other, thus halving the thickness of metal round the seam when the top and bottom are seamed on, has recently been designed by F. J. Edwards, Ltd. The two notching heads are adjustable on the top beam, while the lower die holders are adjustable along the back of the bed. The machine is fitted with standard punches and dies for 45° notches, and the table is tee slotted and carries two adjustable side gauges. Of the undercrank type, the machine can be mounted on bench or stand, and is arranged for motor drive with flange mounting motor and reduction gear unit and push-button starter.

Chocolate and Confectionery

ALTERNATIVE METHODS FOR EFFICIENCY

The alternatives of rationalisation or competition as a means of attaining the highest efficiency within the industry were discussed by Mr. A. Whittaker when he addressed the Institute of Chocolate and Confectionery Distributors.

Despite the fact that distribution was now less than half the pre-war level, practically the same number of factories were being maintained, all operating proportionately on the 1939 basis. The present method had its attractions, but no industry which was progressive could be stabilised on the basis of 1939 or any other given year.

Speaking of the ultimate issue of the two alternatives, Mr. Whittaker said he presumed a rationalisation scheme would imply the appointment of some statutory corporation which would bring in more statisticians, substitute a dietitians' specification for consumer choice, calculate the number of factories and shops required, sell at a price based on cost, and inevitably run at a loss. It was necessary, therefore, to return to competition, however difficult it might be.

The solution of the industry's problem, he contended, rested upon some increase in the total supplies. The industry did not believe in the indefinite continuance of the present system, and it was felt that, if the level of supplies were increased, effective demand would be equated, rationing could cease, and the system of competition could return.

In his closing remarks, Mr. Whittaker referred to the supplies of milk. Supplies of full-cream milk to the industry were stopped in 1940 and, apart from adventitious supplies during the summer flush, there had been no planned allocation since. During the war there were supplies of imported milk powder, but now even these were threatened by the dollar crisis. The chocolate industry was therefore faced with two major problems—rehabilitation of the cocoa-growing industry and restoration of its use of milk.

Celebration at Rochester

To celebrate the securing, in conjunction with Leyland Motors, Ltd., of a contract from Uruguay for the supply of their refrigerating trailer bodies, with independent mechanically-driven plant, Morrisons Engineering, Ltd., held a luncheon in the factory canteen at their works at Rochester on October 28. Guests, including the Mayor of Rochester, were invited to inspect the first completed unit before shipment. In addition, a partly built unit showing method of construction was displayed, as well as examples of other refrigerated, insulated, and crate type containers.

Frozen Food Research

Set up last year to ensure the fullest co-operation and collaboration between the various research organisations engaged in the field of food, the Frozen Foods Consultative Group, which is now announced for the first time, is an informed group consisting of representatives of research organisations, official and semi-official, under the chairmanship of the Director of Food Investigation, Dr. Franklin Kidd, F.R.S.

The objects of the group are in the main the exchange of information on research investigations in progress on the preservation of food by quick freezing processes to prevent overlapping and to discover gaps in research programmes. Terms of reference are:

(*a*) To table and discuss the results of investigations into new developments in methods of preserving food by freezing.

(*b*) To consider the planning of further investigations. This shall not include direction of research, each organisation retaining its own independence and the responsibility for its own programme.

(*c*) To maintain contact between investigators in such fields as packaging and engineering which bear on preservation by freezing.

(*d*) To direct enquirers in industry to the best sources of information.

The following research organisations and stations are represented in the Group:

Low Temperature Research Station, D.S.I.R.
Torry Research Station, D.S.I.R.
Ditton Laboratory, D.S.I.R.
Scientific Advisers' Division, Ministry of Food.
British Food Manufacturing Industries Research Association.
Printing, Packaging, and Allied Trades Research Association.
British Baking Industries Research Association.
Fruit and Vegetable Preservation Research Station, Chipping Campden.

The group has power to invite to its meetings representatives of other organisations such as the Refrigerated Cargo Research Council, the Institute of Refrigeration, and the Food Manufacturers' Federation.

The secretary of the group is Mr. P. R. P. Claridge, Food Investigation Organisation, Lloyd's Bank Chambers, Hobson Street, Cambridge. Telephone: Cambridge 55604.

Refrigeration on Loan

A plan to make available to local residents storage space in their plants on the locker system is being developed by one of the largest cold storage concerns in Scotland. Such a locker would hold food over a much longer period and its cost would not exceed the running cost of a domestic refrigerator. Existing supplies of steel are not sufficient, however, to permit the maturity of this plan at present.

All-out Coffee Campaign

Speaking to the North-Staffordshire Grocers' Association at Stoke-on-Trent on October 12, Mr. K. B. Mackenzie, M.B.E., honorary secretary of the Coffee Buyers' Association, outlined his plans for the improvement of coffee in Great Britain.

He said that an all-out campaign to increase public interest in coffee generally was being launched by the Association. In the future he also hoped to see a National Coffee Association, representing the wholesale and retail trade in its entirety. Members would pay a nominal subscription and it would be a full-time organisation which could change the whole outlook on coffee.

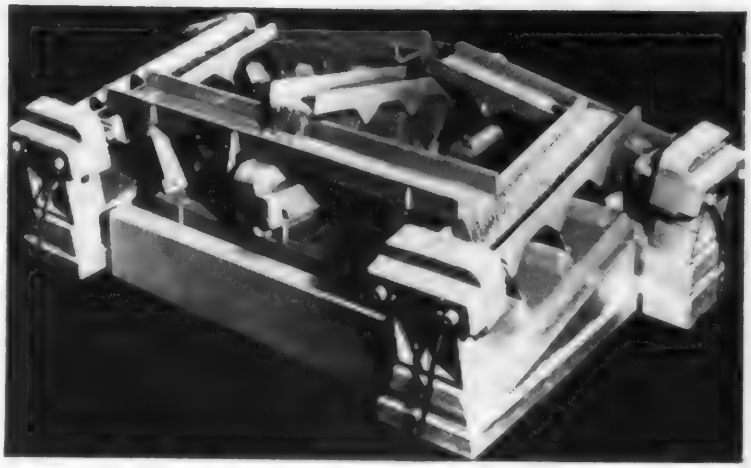
Master Bakers Meet the Irish

Mr. Victor Joseph, President of the National Association of Master Bakers, and an official party were guests at the first post-war conference of the Irish Association of Master Bakers held in Cork.

In reply to a greeting of "one hundred thousand welcomes," Mr. Joseph emphasised the value of the British Baking Industries Research Association, which, since its formation two years ago, had done tremendous work in seeing that the public secured the best bread possible from the methods and materials available.

"In America, canned bread has already made its appearance," he said, "and one buys a canned loaf just as one buys a tin of pineapple."

At the election of the new President, Mr. Patrick Brennan, Mr. Joseph said he hoped some of the irksome restrictions facing the bakery trade would be lifted during his year of office.



Laboratory size model of the new electromagnetic reversible conveyor in conjunction with similarly operated feeders.

Electromagnetic Reversible Conveyor

On the new reversible type of electromagnetically operated trough conveyor, developed by Fraser and Chalmers, upward movement can be arranged on either the forward or return stroke by means of two separately controlled vibrators, one of which is responsible for horizontal movement, while the other controls the vertical component. The direction of flow is thus dependent upon whether the upward movement is developed on the forward or return stroke.

Each vibrator is operated through a half-way rectifier and the amplitude controlled by a rheostat. The direction of flow of material on the conveyor is controlled by a change-over switch which enables the polarity of one rectifier circuit to be reversed.

Thus in one case the two coils are each energised through the rectifiers from the same half-wave, *i.e.* the forward movement is in phase with the upward movement causing the material to move forward. In the other case the two coils are separately energised from alternate opposing half-waves, the two being of opposite phase, *i.e.* the return movement is then in phase with the upward movement, causing the material to move in the opposite direction.

This new development should find considerable uses in the materials handling field, especially where the saving of headroom is of primary importance and the instantaneous reversal of flow of material is essential.

Surplus Herring Disposal

IMPORTANT PROJECT FOR YARMOUTH

Recognising Yarmouth's position as the most important herring port, Sir Frederick Bell, chairman of the Herring Industry Board, stated recently that they were anxious to install a very large herring reduction plant in the town. In this plant there would be large storage capacity for pre-treated herrings and it was hoped to be able to take in large quantities of herrings on days of big landings and pre-treat them. Then on the days when herrings were not available, those already in stock could be processed.

The method consisted of pumping the herrings into tanks after mincing. After the oil extraction there was a residue which was of the nature of protein in soluble form. In Scotland the protein had been dried with the help of the Scottish Milk Marketing Board and "a very nice-looking protein powder" had been produced with which feeding tests were being made.

Mechanised Oatcake Manufacture

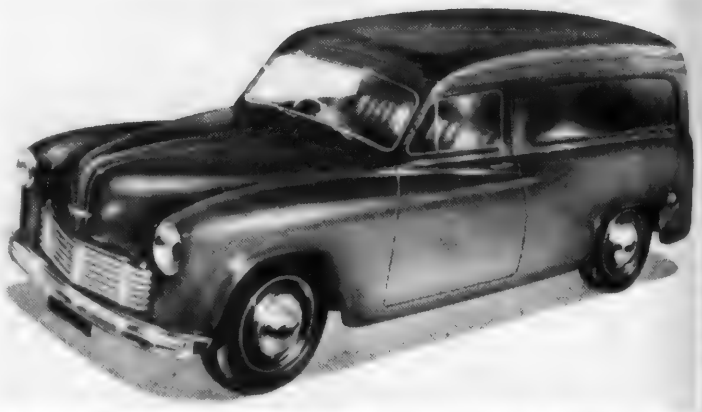
One interesting development in the oatcake manufacturing field is the proposal to introduce a travelling hot plate for baking the cakes. Most of the major plants now operate a cutting machine which stamps out thousands of cakes per hour, but subsequent processing, including packaging, has been done largely by hand, and only now is experimental use being made of bread baking practice.

Welsh Industries

A new era is now dawning in Welsh industry. In addition to the reorganisation of their basic industries, lighter industries have been established in many parts of Wales in districts where raw material and abundant labour are available. In conformity with their purpose of keeping the world informed of the activities of Welsh industry, the Industrial Association of Wales and Monmouthshire have now produced an *Industrial Directory of Wales*. This directory contains some introductory articles on important Welsh industries, following which products and services are arranged alphabetically, giving under each classification the names of firms supplying the product or service indicated. A large portion of the directory is devoted to locations of factories, offices, branches, etc., with comprehensive details of manufactures and services in which the firms are engaged, while an industrial map of Wales and Monmouthshire occupies the two centre pages. The publication concludes with an account of the organisation and activities of the Association.

D.S.I.R. Information Section

The Information Section of the Department of Scientific and Industrial Research is now at Rex House, Regent Street, London, S.W. 1. Telephone: Whitehall 9188. For the time being the rest of the Department Headquarters will remain at 24, Rutland Gate, London, S.W. 7.



The new Commer Supervan, restyled in modern streamlined manner.

New Supervan

With a body capacity of 100 cubic feet and comfortable two-seat accommodation, which gives an unrestricted view of the road through a curved anti-dazzle windscreen with special double wipers, the new Commer Supervan combines distinctive appearance, high performance, and generous load capacity with lowest possible running costs.

An outstanding feature is the new independent front suspension system embodying coil springs, mounted on a massive cross-member, a design which affords greatly improved road holding qualities, increases tyre life, and gives a smooth running over all road surfaces. A further innovation is the new all-steel body, which, welded to a box-section underframe, forms one complete unit of immense strength. An other notable feature is the synchromatic gear-change, which incorporates a new "side-mounted" synchromesh gearbox, a special linkage and "finger-tip" control.

Speedier deliveries are facilitated by the 35 b.h.p. four-cylinder engine, which embodies a three-bearing crankshaft, detachable cylinder head, forced-feed lubrication system and down-draught carburettor, and which is constructed as a single unit with heavy duty dry-plate clutch and syncromesh gearbox. Power is transmitted from the gearbox by a needle roller-bearing propeller-shaft to a spiral bevel rear axle with semi-floating axle shafts. Four-wheel hydraulic brakes, of the two-leading shoe type, on the front wheels, requiring only light pedal pressure, are self-energising, while all wheels, of the "easy-clean" type, carry extra low-pressure tyres.

Mrs. Peek's Christmas Pudding packaged in a tin with multi-coloured presentation is being exported in large quantities.

Machine for Stamping Mail

Approved by the Postmaster-General, a machine known as the "Neopost," which is made by Roneo-Neopost, Ltd., avoids the necessity for the purchase of stamps and the keeping of a postage book. It franks and postmarks at a much greater speed than is possible when using postage stamps, and will print any message on outgoing mail. The sales message can be rapidly changed when required. Meters keep a record of the postage used and payment can be made to the local Post Office periodically by cheque.

Sunflower Seed Cultivation

A scheme for home production of sunflower seeds is being put into operation by an Essex firm. The scheme, which is based on experience gained in Canada, includes the preparation of 127 acres for sunflower cultivation and the establishment of a processing factory in the future. Every help will be given to farmers throughout the country who care to try their hand at producing sunflower seed crops, and visitors will be welcome at all times. Mr. Michael Regan, principal of the new sunflower seed organisation, declares that East Anglia is eminently suited to the crop, and that a nation-wide link-up should remove the necessity for the import of this seed.

Refrigeration Exhibits

An ammonia compressor of the latest design for low temperature refrigeration and quick freezing of foodstuffs was one of the principal exhibits by G. and J. Weir, Ltd., at the 1948 Dairy Show.

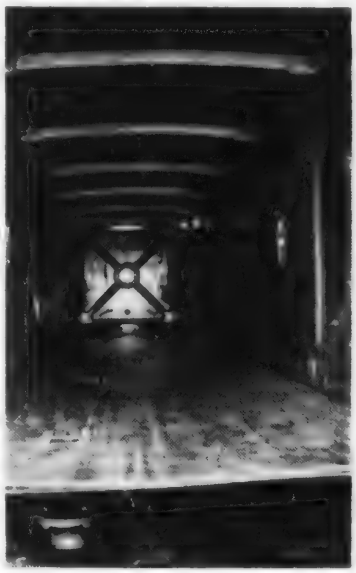
The firm also showed a comprehensive range of commercial condensing units using methyl chloride or Freon F12 as refrigerants, and various sizes of ammonia compressors in addition to the compound machine for quick freezing. Other exhibits included air coolers for general food produce and milk storage rooms; shell and tube and economiser condensers; and one of the standard range of Weir homogenisers.

The Story of Tea

More than 4,000 years ago, the Chinese say, the Emperor Shen-Nung first discovered tea. The Emperor, being learned in health matters, always boiled his drinking water, and when, one day, a few leaves fell into his cup from the tree above, he was so delighted with the aroma imparted to the water that he made enquiries and found the leaves were of the wild tea-plant. Several other similarly amusing stories of the discovery of tea are contained in a colourfully illustrated book recently published which tells the story of tea, how it came to England, its introduction to India and Ceylon, its blending, and its preparation for drinking in various countries.

Brewery and Confectionery Engineering

Filters for beer, wines and spirits, pipelines, glass enamelled steel tanks, sectional tanks, and one-piece tanks (galvanised, lithcoted, or polythene based plastic according to requirements), are among the plant manufactured by Montague, Sharpe and Co., Ltd. The firm commenced business in 1896 as brewers' engineers, bringing to the trade new processes for the procurement of the keeping qualities and finish of the present-day bottled beer. They took up confectionery engineering in 1931 by the provision and installation of a glucose storage and distributor scheme in London, and now manufacture glucose control valves of their own design. They also have considerable experience in the installation of flowmeters for economical working.



Part of pressed steel sectional tank.

Middle East Tour

Mr. S. A. Gregory, of The A.P.V. Co., Ltd., recently returned from a four-month tour in the Middle East during which he studied the processing of agricultural products. His tour included visits to Greece, Cyprus, Egypt, Iraq, Syria, the Lebanon, Palestine, and Turkey.

Continuous Fruit Freezer

A new quick freeze plant known as the "Winchester" freezer, produced by Food Installations, Ltd., requires only one operative and is capable of freezing 2,500 lb. of fruit per hour continuously. The produce to be frozen is conveyed in loose form upon a moving belt and comes into contact with a series of films of liquid refrigerant which flows continuously over the fruit. The absence of spray nozzles eliminates the need for high pumping horse-power and permits low-temperature sugars to flow evenly over the produce. By this method the high rate of heat transfer between the produce and the refrigerating medium necessary for quick freezing is obtained. Because of the use of a sugar solution, only 6 per cent. weight of sugar is added to the fruit, giving it a better and more natural taste, and resulting in a big saving of sugar. When flowing over the fruit at a low temperature, the solution seals the pores, displacing the air in them, and thus assisting in the prevention of oxidation of the surface. The absorption of the sugar into the pores also eliminates any chance of bleeding.

While this method has all the advantages of the cold pack, it avoids the use of excess sugar and results in the production of individually frozen fruit. It also presents an opportunity for storage in barrels as a substitute for the present cold pack system under conditions which are far more ideal.

Deaths

Mr. James W. Viney, formerly works director of T. Wall and Sons, Ltd.

Mr. Viney retired early this year after forty-five years' service with the company. He started work in the meat factory in 1903, rose to the position of ice cream depot manager, and finally became works director, joining the board in January, 1942.

Mr. Herbert Coulson Marr, managing director of Midgley and Parkinson, Ltd., fruit preservers, of Stanningley, Pudsey.

Batchelor's Conference at Buxton

INTRODUCTION OF A NEW PRODUCT

A novel stage, displaying a large-size reproduction of a can of Batchelor's new soup "Cottage Broth," was used effectively to introduce the special reunion conference which was held at the Palace Hotel, Buxton, from October 11 to October 15.

On the unveiling of the replica of the can, all the hotel chefs appeared carrying model cottages, underneath which were large tureens of "Cottage Broth," which was then served to all those present.

This was the high-light of a successful week, in which some 175 representatives from the sales, agricultural, dealer service, and factory sides attended the first full conference since 1939.

In welcoming the delegates, the chairman, Lieut.-Colonel M. W. Batchelor, J.P., gave a complete *résumé* of the history of the company, and its progress over the last thirty-five years; he outlined the plans for the future, stressing the present-day difficulties of raw material supplies, and stated that the success of canning concerns at present was regulated largely by the limited supply of cans. He made reference to the disappointment of the trade that it had not been possible to re-introduce packet peas in cartons, and warned the delegates that the buyers' market was only just round the corner, and that they must be prepared to face keen competition when controls were removed.

He also made special reference to Poulton and Noel of Southall, and pointed out that the original company name had ceased to exist, and that the new name for the Southall factory was Batchelor's Peas (Southall), Ltd.

Other directors present were Mr. L. Mason (Joint Managing Director), Mr. F. W. Sadgrove (Marketing Director), Mr. J. A. Truesdale (who spoke on the Southall factory, its history and present relationship with the main factory at Sheffield), and Mr. C. O. Barber, directors of the Southall factory.

In the banquet hall of the Palace Hotel, Buxton, during the sales conference of Batchelor's Peas, Ltd. The chairman, Lieut.-Colonel M. W. Batchelor, J.P., is standing in centre.

Film Congress Developments

As a result of the International Scientific Film Congress organised by the Scientific Film Association of Great Britain with the assistance of the British Film Institute, various sub-committees have been set up to deal with the following problems:

1. The establishment of an international data card for compiling a master index of scientific films available throughout the world and the formulation of methods of appraisal of these films.
2. The joint production, by a number of countries, of films of common interest.
3. The exchange and distribution on the widest scale of scientific films and the customs regulations affecting such exchange.
4. The setting up of a Scientific Film Reference Library.
5. The exchange of information between nations by means of a regular journal.

The officers elected by members of the Association for the coming year are:

President: M. Jean Korngold (Poland).
Vice-Presidents: Mr. John Maddison (Great Britain), Mr. C. A. Burmester (Australia).
Hon. Secretary: M. Jean Painlevé (France).
Hon. Treasurer: M. Luc Haesaert (Belgium).

Ridding Town of Rats

Glasgow's campaign to remove the rat menace is to be intensified. Data issued recently by the Corporation Public Health Department indicate that since the start of this campaign in 1944 some 24,000 rats have been killed, and the saving in food is estimated at a value of £100 for every £1 spent. The Glasgow Sanitary Department have followed a policy of blocking off certain areas in the city on the map and working systematically through each building in the block. Certain restaurants have been found to be particularly badly infested and to be breeding grounds from which rats moved to other food stores. Once the premises are cleared, every possible entry for the pests is eliminated by the use of concrete and wire mesh, and in the 20 square miles already covered some 95 per cent. of the buildings are now rat-proof.

Manicures Help Hygiene

An attractive idea from the viewpoint of both girl workers and consumers has been adopted at a Glasgow bakery. Realising the need for personal hygiene, the firm adopted an American policy in offering girls regular weekly manicures which had the dual effect of ensuring that girls became "hand-conscious" and consequently scrupulously clean in their habits, while adding at the same time a beauty service free of charge.

The policy, which has proved successful, might well become standard practice in food plants, and might help to meet the outcry against unhygienic methods of food handling.

International Organisation for Standardisation

The interchange of canned foodstuffs between countries in recent years has emphasised the world-wide progress of the canning industry and the necessity for collaboration.

An international conference recently held at the offices of the British Standards Institution has had for its object the simplification of trade in canned foodstuffs by endeavouring to reach agreement on sizes of cans to be used in a number of countries. A keen interest is felt in this subject in all food exporting and importing countries, and Australia, Austria, Belgium, Denmark, France, Hungary, Italy, Netherlands, New Zealand, Palestine, South Africa, Sweden, and Switzerland will participate actively in the work. Brazil, Chile, Mexico, and the U.S.S.R. are keeping in close touch with developments.

The conference considered the practicability of agreeing upon a standard range of sizes of cans based on capacity and linking these capacities with standard dimensions. Other questions, such as the methods of measuring can capacities and dimensions, are under consideration.

Good progress was made at the meetings and the delegates have returned to their own countries in order to carry out some experimental work before a further international conference can be held.

Dr. D. W. Kent-Jones with Dr. Roche Lynch and Mr. F. Rowlands, chairman of Procea Products, Ltd.

Scientific Bakery

The latest scientific apparatus now in use in the baking industry was shown at the Procea Bread Convention, held at the Waldorf Hotel, London, and attended by several hundred bakers from all over the country.

Exhibits included the latest form of Chopin Moisture Tester not previously seen in England, which is designed to get a moisture test in five minutes as against five hours by usual methods. With this apparatus the wheat is put in a metal receptacle and by heating it the moisture is driven out on to the carbide which can be ignited. So long as the flame burns, moisture is being driven from the wheat. As soon as the flame dies down, the wheat is removed just before it begins to char.

The Chopin Alveograph, an instrument designed to determine the physical qualities of wheat, was also shown.

At the dinner, attended by some 450 people, given by the company at Grosvenor House in the evening, Mr. S. A. Lancaster, managing director of Procea Products, Ltd., in the course of his speech said that much bread was wasted because of bad technique in baking. Expressed in terms of flour, the elimination of a wastage of only 1 per cent. would represent a saving of approximately 15,000 tons a year. Mr. Lancaster said that if the public would insist upon buying only bread which attains a certain standard, he was confident that when the present restrictions were removed there would be considerably more bread eaten and enjoyed.

In proposing the health of the guests Dr. Kent-Jones said that they had present some of the best bakers in the country. He also made reference to the presence of a number of guests such as those who provide the firms with their raw materials. Also present were Dr. Roche Lynch, President of the Royal Institute of Chemistry, Mr. Cecil Loombe, a director of Joseph Rank, Ltd., Mr. W. Leonard Hill, the enterprising publisher of technical journals, and the official guest of the evening, Dr. J. B. M. Coppock, director of the British Baking Industries Research Association.

In response to this toast, Dr. Coppock expressed thanks for the encouragement and help extended during the early life of the Association. Dr. Kent-Jones, he said, had been much more than a cereal chemist; he was one of our most notable ambassadors of science, and it was fitting that his name should be associated with the firm that had so successfully exploited a scientific idea and which had been converted into commercial realism. Dr. Coppock stressed the desirability of freedom of choice in our foodstuffs which, to him, was just as important as the freedom enunciated by Mr. Churchill. It was not so much a matter of dark or white bread, but that of freedom to choose the bread we preferred. Why should some nutritionalists tell us that we must eat dark bread when by enriching our flour or balancing our diet we could achieve the same nutritional end, but with the added zest of eating?

Human Factors in Industry

INSTITUTE'S RESEARCH PROJECTS

The Committee on Industrial Productivity, which has been empowered by the Government to initiate research projects where they seem desirable, is advised by four panels, dealing respectively with Technology and Operational Research, Imports Substitution, Human Factors, and Technical Information Services. Among the various bodies who have undertaken research for the Human Factors Panel is the National Institute of Industrial Psychology whose projects concern three problems: the selection and training of foremen, joint consultation, and the size of the unit of work.

The investigation on foremen will start with a survey of present practice in selection and training, and of the status of foremen relative to middle and higher levels of management. Later on experiments to evaluate selection and training methods under controlled conditions will be carried out.

The method of the Institute's research into joint consultation will be similar to that of the foremen investigation, *i.e.* a survey of existing practice, followed by experimental work. The survey will aim to cover a widely representative cross-section of industry, to find how many firms use consultative machinery, of what type, and how effective it seems to management and workers. Further work is planned to compare the effectiveness of various methods, and their relation to organisations of different size and structure.

The unit of work project is intended to find how far increase of job breakdown reduces the will to work, and how output varies with the size of the batch handled in repetitive work.

These investigations, which should make a valuable contribution to basic knowledge on all three problems, depend primarily on the willingness of individual managements to assist, and of their workers to co-operate. The Institute will approach a number of firms in the near future, and would be glad to hear from any organisation whose experience leads them to take a particular interest in any of the problems.

Appointments

Mr. F. N. Graham, B.Sc., has been appointed residential agent for Polak and Schwarz (England), Ltd., for Eire and Northern Ireland, and he has now taken up residence at 17, Alma Road, Monkstown, Co. Dublin.

*

Mr. J. B. Gwynne Lewis recently retired from the position of manager of the Cardiff office of George Ellison, Ltd., after thirty years' service in that post. He is to continue to act in a consultative capacity until September, 1949, when he will finally retire.

Mr. Lewis is succeeded by Mr. A. G. K. Williams, who has been with the Ellison organisation for many years.

Mr. Reginald H. R. Palmer, M.C., who has been a director of Huntley and Palmers, Ltd., since 1919, has now been appointed chairman in succession to the late Sir C. Eric Palmer, D.L., J.P.

Mr. Palmer is also a director of Associated Biscuit Manufacturers, Ltd., and of Huntley, Boorne and Stevens, Ltd.

Opening of Research Centre

The new research centre of the Printing, Packaging and Allied Trades Research Association at Leatherhead, Surrey, was officially opened by H.R.H. the Duke of Gloucester, K.G., on October 28. The Duke performed the opening ceremony at the original centre in Robin Hood Court, Shoe Lane, London, E.C. 4, in 1937, but those laboratories were destroyed during an air raid four years later. Building of the new research centre, which began some years ago, was completed sufficiently for the staff to begin to move in during July and August of this year.

Booklets Received

Incorporating previous booklets under the heading *Baking Lacquers for Food Containers* and *Closures*, A. Ll. Matthison's booklet gives some information on improvements made in the canning industry and in the manufacture of food-can lacquers during the last few years. In addition an account of the application of lacquers, types of container and methods of processing, notes on lacquers manufactured by Arthur Holden and Sons, Ltd., and a history of their operations are included.

*

A booklet on fans giving the terms, definitions, and standards in use by the fan engineering industry has been produced by the Fan Manufacturers' Association, Ltd. The contents include a list of units and abbreviations, formulae, diagrams of working pressures for various fan arrangements, and tests, curves and laws relating to fan performance.

*

Among recent developments of the company described in the autumn issue of the house journal of Maurice Lee Unger, Ltd., is the completion of a new brick building, housing reception and switch rooms and a research laboratory. Adjoining the laboratory is a new canteen, built entirely by the company's own workpeople. The present vegetable preparation department and the two adjacent buildings are gradually being combined to form one complete unit which will handle all soup production from start to finish. The publication also includes an article on the company's trade policy and a description of the method of printing labels for the tins which contain the firm's products.

*

The first of a monthly series entitled *Management Abstracts*, which are intended as a digest of material published in any part of the world, has been produced by the British Institute of Management. The abstracts, which provide information on current science, are grouped under such headings as general management and organisation, works management, personnel and welfare, distribution, etc.

COMPANY NEWS

Adverse effects of international political and economic tensions and the inability to match prices with rapidly rising costs no doubt account for the decline in group profits of the firm of Horlicks, Ltd., for the year ended March 31. This decline is fortunately offset by reduction of the tax charge. The maintained dividend of 30 per cent. is covered by earnings of just over 50 per cent. Valuation of goodwill is moderate in relation to proved earning capacity and to long-term trading prospects of good suppliers.

■

In accordance with decisions taken at a meeting of the directors of J. and J. Colman, Ltd., held on October 4, an interim dividend of 5 per cent. on the ordinary stock of the company has been paid to all stockholders on the register at the close of business on October 6.

■

As a result of greatly increased profits, a 20 per cent. dividend to shareholders of the National Canning Co. has been proposed by the chairman, Mr. S. W. Smedley, as against 15 per cent. and a bonus of 5 per cent. last year.

*

During its last financial year, which ended on May 31, Stratford-on-Avon Produce Canners became a public company with a reorganised capital. Besides canning fruit and vegetables, an expanding business in jam-making was in being when the shares were brought before the public in June last year. Demand was reported as very much greater than production, which was limited to some extent by the tinplate position, but despite difficulties during the period, a production record was attained and the net result for the year compared favourably with that of 1947.

A final dividend of 55 per cent., making a total of 85 per cent. for the year, was recommended.

■

A substantial increase in turnover during the year under review as compared with the eight previous years was announced by the chairman, Mr. J. G. Elliott, at the annual general meeting of Lovell and Christmas, Ltd. During the year they had been able to resume some of their importing functions and engage in new activities on a trader-to-trader basis in certain miscellaneous foods; they had also expanded their export and *entrepôt* trade and enlarged their contacts in overseas markets.

Referring to the dairy industry, the chairman said it was probable that, of all foodstuffs, dairy products would be the last to achieve a full supply in relation to the effective world demand. A return to normal in the importation of such products would, it appeared, be long deferred. An increase in the supply of bacon and eggs for distribution, however, was expected in the not-too-distant future, and there was a probability that arrangements would be made for the de-control of the processed cheese industry.

The report and accounts were unanimously adopted and the recommended dividend of 6 per cent. on the ordinary shares was approved.

*

Presiding over the twenty-fourth annual general meeting of George Cohen Sons and Co., Ltd., Mr. Cyril M. Cohen, chairman and managing director, said that the firm were now reaping the benefit of extensive modernisation and general re-equipment which were begun some time ago and the all-round increase in turnover was favourably reflected in the trading figures.

The 4½ per cent. preference dividend and an interim dividend on the ordinary stock of 8 per cent. had been paid, and a final dividend of 12 per cent., making 20 per cent. in all, was proposed.

■

Mr. F. Herbert, chairman and managing director, presiding over the twenty-eighth annual general meeting of the Danish Bacon Co., Ltd., said it was difficult to estimate what the immediate future of bacon production would be, but there were indications that the present decline in arrivals at Danish bacon factories was caused by the holding back of stock for future expansion.

Five per cent. as interim (and final) dividend on the ordinary shares, and 5 per cent. on the preference shares provided for the distribution of some £20,000 gross.

OBITER DICTA

● People enjoy a film more with a mouthful of something to chew.—*Ald. Mrs. J. Bolster, Wood Green.*

● It would be better if children spent their money on chips rather than on so much ice cream.—*Mr. M. Carter at a meeting of the Epsom and Ewell Food Committee.*

● Ninety-nine per cent. of present-day conversation is about grub.—*Mr. A. E. Orbell, J.P., at the annual dinner of the Brighton and Hove Caterers' Association.*

● May I ask, Mr. Speaker, if it is in order for an Hon. Member to call another a "dirty dog"? I should like to be authoritatively advised.—*Mr. Winston Churchill.*

● The last ten years has brought about a revolution in the nation's diet and a "good cut off the joint" has become a misnomer, and almost a memory. *Mr. J. I. Partington, President of the National Federation of Meat Traders' Association.*

● The thing I miss most in this present time is cheese. I still look forward to the time when I am able to have on my table a piece of Stilton, Cheshire, Cheddar, or Blue Vinney. And not the little bit you could put into a mousetrap.—*Lord Llewellin.*

● I object to these ladies serving in restaurants with their nails plastered with all kinds of funny stuff that gets mixed up with the food. Both the Mayoress and I have refused food served by such people at public functions.—*The Mayor of Lambeth.*

● The formula is to take a stick, dip it into a mixture of coloured water, perhaps with a little sugar added, freeze some, remove the stick, and that is an "iced lolly."—*Councillor Dr. D. S. Bryan-Brown of Stoke Newington Borough Council.*

● If you want to preserve the people, if you want to feed them, you must serve the needs of British agriculture and the British farmer. You won't do that by smothering it with directions and orders worked out in a Whitehall office.—*Robert Crouch, in a broadcast.*

News from Overseas

Getting Herds to Market

Backed by the Australian Meat Board, a large-scale test is being made to discover how far motor transport can assist in overcoming the difficulty of getting herds to market in good condition. A motor road train consisting of a truck and two large trailers with a total length of 135 feet has recently been built for use at Alice Springs, in the centre of Australia. The unit can carry 90 bullocks at 20 m.p.h.

Sugar Research Awards

Established by the Sugar Research Foundation to stimulate scientific studies of sugar as a food and an industrial raw material which may lead to its greater usefulness, the fourth Intermediate Sugar Research Award is to be made by the National Science Fund in March, 1949. An award of 5,000 dollars will be given in 1949, with a grand prize of 25,000 dollars to be given in 1950 for the most significant discovery of the preceding five years. Judgment, which is made by the special Advisory Committee of the Fund, will be based on the importance of work submitted in terms of the advancement of knowledge and of public benefit, and all communications with respect to the awards should be addressed to: Executive Secretary, National Science Fund of the National Academy of Sciences, 2101, Constitution Avenue, N.W., Washington 25, D.C.

The third award was presented this year to Dr. Leslie F. Wiggins, of the University of Birmingham, for his research on utilisation of sugar as the source of many important organic chemical compounds, and in particular for his conversion method for the production of levulinic acid. An account of his studies is given, together with articles on sugar-cane wax, sugar and honey, land utilisation, and other subjects in the July issue of *The Sugar Molecule*, published quarterly by the Sugar Research Foundation. The organisation has also published its fifth report for 1948, which contains many references to projected and completed work on sugar.

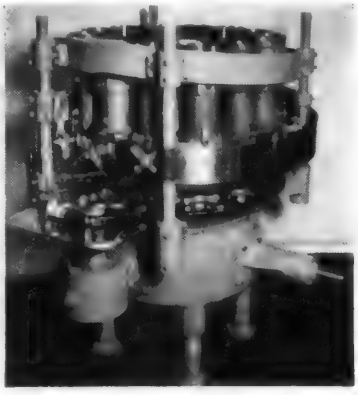
Pearl Paste from Herring

From the thin luminous film with which the scales of the herring are covered, two Norwegian firms are producing pearl paste for the manufacture of artificial pearls, and use in the celluloid, plastics, bakelite, and allied industries to produce varied mother-of-pearl effects.

Rotary Piston Filler

A rotary piston filler which can be used for the filling of tomato paste, meat products, soups, jellies, heavy syrups, and all other products which can be handled by a piston pump has been produced in America.

The standard cylinder capacity is 55 cubic in. and will fill 350 medium containers per minute. Smaller pistons are supplied for smaller containers with a minimum diameter of $\frac{3}{4}$ in.



The machine is equipped with an adjustable, gravity feed container chute. Containers are fed to the chute through a runway and a screw or chain feed can be supplied for floor level, glass or light cardboard container feed. Containers slide on to the stainless steel feed table and are picked up and timed on to a stationary table where each container is centred under a piston and valve for filling. Containers are slid and guided around the filler by guide rail and chucks. When no can is under the valve during the filling cycle, the valve ports are so turned that the product is forced back into the bowl of the filler.

Brislings Threaded Automatically

A new machine which may mean a revolutionary change in the canning industry has been devised in Norway. The invention is an automatic threading machine for hanging and spacing the brisling preparatory to being smoked. Laboratory tests have proved promising and two complete automatic threading machines are now under construction. The machines, when completed, will undergo decisive tests under practical factory conditions; if these prove successful, the rate of packing will be greatly increased and will make possible a much higher output with a considerable saving in female labour.

Brazil to Re-equip Sugar Industry

Brazil is planning to overhaul and re-equip her entire sugar industry with American machinery and methods, according to Mr. Gileno de Carli, representative of Brazil's Sugar and Alcohol Institute, which links the industry together and takes care of producers' interests.

Even under present conditions, Brazil's 400 sugar mills turn out upwards of 22 million 132-lb. sacks of sugar yearly. This output, Mr. de Carli asserted, could be increased by 28 per cent. merely by improving milling processes. All of this increase could be exported as one means of paying for new equipment, as Brazil's present output fully meets domestic demand and has left a surplus of some four million sacks for annual export during the past two years.

This surplus has been shipped to Argentine, Uruguayan, and European buyers rather than to the United States because of the special arrangement the United States has with Cuba. However, if free competition were allowed, Brazil could likewise supply the U.S. market with a considerable quantity of high-grade sugar. This would be a big help in alleviating the dollar shortage which has hindered Brazil-U.S. trade and would not seriously affect Cuba's market.

Protective Coating for Wood

A coating named "carbokote" which has been developed in the U.S.A. protects wood floors, tanks, and tables from corrosive materials used in chemical and food-processing plants. Available in liquid form, the coating hardens to a firm, smooth surface that resists most acids, alkalies and chemical solvents, and cannot be separated from the wood. It is made of heat-resisting resin and will withstand temperatures up to 325° F.; at higher temperatures it will decompose slowly.

Although originally developed for use on wood, the coating is said to adhere just as well to rubber and carbon, and research is now being carried out to adapt the coating for use on steel.

Insulating Material from Sugar Cane Residues

Sold under the trade name "cane-ite," boards made from the residues of the sugar industry in Australia have insulating qualities which make them suitable for the lining of lightly constructed houses and for lining refrigerated rooms for the preservation of perishable foodstuffs. The boards are made from megass, the residue of crushed cane fibres left after the sugar juices have been extracted. The megass is passed through various chemical and fibrating processes and then undergoes further intensive washing on rotating cylindrical screens and is mixed with water to produce what is known as stock. The stock is treated again with chemicals so that each individual fibre is waterproofed and rendered immune from rot, fungus-growth, and the ravages of white ants. After mixing with larger quantities of water the stock passes to forming-machines which produce a continuous sheet of fibre mat. This is squeezed through rubber-covered rollers and then fed through a wet saw which cuts it into lengths up to 16 feet and feeds the sheets to the loading tipple. The tipple automatically distributes a cut board to each of eight conveyors which carry the boards into a steam-heated drier. After drying, the boards are directed by another tipple to an automatic saw which trims them to standard size ready for packing in crates.

Gold Coast Cocoa Disease

VISIT OF SCIENTIFIC COMMISSION

A commission of three scientists has been appointed to visit the Gold Coast and report on the measures necessary for the eradication of swollen shoot disease of cocoa trees.

The members of the commission are Dr. G. Berkeley, of the Dominion Laboratory of Plant Pathology, Canada; Dr. W. Carter, head of the Department of Entomology, Pineapple Research Institute, Hawaii; and Professor van Slogteren, of Holland.

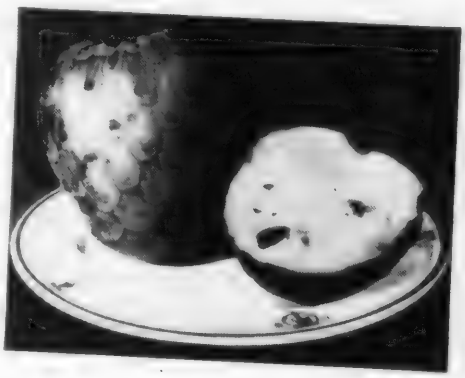
Their terms of reference are:

> Having regard to the research work in swollen shoot disease of cocoa trees in the Gold Coast being carried out by the West African Cocoa Research Institute, to study the incidence and nature of the disease and to report on the technical measures necessary for its speedy eradication.

The appointment of this commission follows on the recommendation of the commission which enquired into the causes of the recent disturbances in the Gold Coast, that a small panel of three plant pathologists, of high repute, and drawn from countries not commercially interested in cocoa, should be appointed.

The three scientists were selected from a list prepared by the United Nations Food and Agriculture Organisation. Dr. Berkeley is a leading authority on virus diseases of fruit trees, while Dr. Carter is an international authority on mealybugs, the vector of the swollen shoot virus, and has done much work on virus diseases. Professor van Slogteren is the foremost authority on virus diseases of bulbs. It is hoped that their enquiries will be finished in time for their report to be made to the Secretary of State by the end of this year.

A Fruit Salad in One



First grown and cultivated on a commercial basis in Southern California, the cherimoya, or "banana-pineapple," has been the subject of scientific investigation carried out by the University of California.

The cherimoya prevails along the slopes of Central America, where it grows wild and bears prodigiously. It is shaped like a strawberry, but is far heavier, weighing 12 oz. to 15 oz. It has a rare flavour described by some to be like a certain kind of vanilla ice cream, and by others as a flavour combination of banana and pineapple. As a delicacy the fruit should be served in chilled form, peeled, and then eaten as an orange, or as a grapefruit.

The toughness of the cherimoya's skin makes it very suitable for long-distance shipment, though the flesh itself is tender and suffers if exposed to temperatures of 28° F. for any appreciable time.

Fruit Juice Bottling in Zululand

A new industry has been brought to Zululand by Mr. J. A. Fry, a farmer of Entumeni, in the form of a granadilla juice factory, the machinery of which has been designed and erected by himself. His farm is a complete production unit, from planting and tending the granadillas as they grow to washing and slicing them in the factory, where a machine separates the skins of the fruit, the pips and the juice into separate channels. The product, which is pasteurised, consists solely of granadillas, sugar, and water.

Fruit Juice Specifications

The South African Bureau of Standards has issued drafts of proposed specifications for lime juice, granadilla squash, lemon and barley squash, lemon squash, grapefruit and barley squash, canned blended grapefruit juice and orange juice, canned orange juice, and canned grapefruit juice.

Irish Chewing Gum

The idea of an Irish chewing gum factory which occurred to F. M. Steele and William Birmingham has now materialised in the establishment of such a factory at Blackrock, near Dublin, and may well lead to the development of a worthwhile industry in Ireland. These two men now head a recently formed company with a capital of £60,000 and it is hoped that, at the top level of production, employment for 300 workers will be found in the company's factory.

The registered name of the product is "Chum" and, as it was the first chewing gum ever made in Ireland, samples were sent to four leading American makers for their criticism. They testified as to its excellence and stated that it was equal to the best in the world.

Infra-red Rays Kill Frost

A new method for the protection of such crops as tomatoes, strawberries, vegetables, and deciduous trees such as the apple, cherry, and peach, has been developed in Michigan, U.S.A., and successful tests have been made by actual growers in more than eleven states. Based on the findings of the Michigan State College that much of the heat lost by radiation from the earth had to be replaced if effective frost control were to be achieved, the apparatus is a generator producing heat energy and transforming it into infra-red rays which are distributed over protected areas. The energy travels in waves until reaching plants.

Growers found they only needed to run the machine for two or three times a season for three to five hours at a time, the consumption of kerosene being 8 gal. to 10 gal. per hour.

Molasses from Wood Waste

The results of pilot-plant production of molasses from wood wastes announced by the U.S. Department of Agriculture reveal that a yield of 150 gal. to 190 gal. of 50 per cent. strength per ton of wood can be obtained. The process consists of pressure hydrolysis of wood chips, using dilute sulphuric acid at high temperatures. The sugar solution is neutralised and concentrated.

Molasses obtained is bitter but suitable as a substitute for blackstrap molasses for stock feed and industrial purposes.

Hydrolysed Protein in South Africa

Hydrolysed protein from whale meat and beef, which has proved of great nutritional value, will be manufactured on an extensive scale in Natal, and exported to alleviate malnutrition in Europe.

The entire manufacturing plant has been bought from the South African Red Cross Society by Mr. Michael Ostrowiak, a well-known Durban industrialist.

Hydrolysed protein products already being produced include wine, malt, sandwich spread, chocolates, toffees, biscuits, and a powdered extract.

News from the Ministries

Fish Frying Licences

In view of the probable issue of 2,000 new licences as a result of the recent announcement by the Minister of Food and the limited amount of oils and fats which can be allocated for fish frying, it has been stated that, as from November 1, no further applications for fish frying licences are being accepted under the terms of the original announcement. Any outstanding applications submitted before that date will be dealt with as soon as possible; applications received since November 1 are being considered only in the light of consumer need in the area concerned.

As from December 5, the fat allocation of all fish fryers who are receiving less than 3 cwt. per eight weeks will be increased to that amount.

Imports from France

Following meetings of the Anglo-French Economic Committee arrangements have been made in agreement with the Board of Trade for the importation of further quantities of the following items: crystallised flowers, angelica, marrons (*glacé*, *purée*, and in syrup), and carlsbad plums from France. Fruit paste and cut and drained and candied peel may now also be imported from the same source.

Applications supported by firm offers will be considered for licences to import these commodities during the period ending December 31, 1948. These applications should be submitted, in duplicate, on form ILD/A to the Import Section, Preserves Division, Carlton Hotel, Pall Mall, London, S.W. 1.

Export Licensing Branch

The telegraphic address of the Export Licensing Branch of the Board of Trade, Regis House, 43/46, King William Street, E.C. 4, has been changed to: Explic, Stock. London.

Tapioca and Sago

The Tapioca and Sago (Maximum Prices) Order, 1947, has been amended so as to increase the maximum wholesale price of tapioca and sago sold in Northern Ireland by an amount not exceeding 2s. 9d. per cwt. It has been found impossible to ship tapioca and sago direct to Northern Ireland from the original sources of supply and the increased maximum wholesale price will cover the cost of reshipment from the United Kingdom.

More Sugar for Manufacturers

As from November 7, an increased allocation of sugar has been made for the manufacture of preserves, sweets, cake and flour confectionery, biscuits, syrup, coffee essence, pickles and sauces, corn flakes, table jellies, ice cream, canned puddings, cake and pudding mixture, infant foods, quick-frozen fruit, and canned spaghetti.

Some sugar has also been reserved for the production of candied peel when fresh supplies of raw materials are available next year.

Fresh Fruit and Vegetables

The following additions have been made to the list of items which may be imported under the open individual licensing arrangements.

The commodities and the countries concerned are:

Cauliflower and broccoli (November 1, 1948, to February 28, 1949)—France, French North Africa, Italy.

Lettuce, endive, and batavia (November 1, 1948, to May 15, 1949)—France, French North Africa, Italy, Spain.

Onions (dry bulb), excluding the silverskin variety (November 15, 1948, to August 15, 1949)—Cyprus, France, French North Africa, Holland, Italy, Malta, Poland, Spain, Syria and Lebanon, Tripolitania.

The dates shown above for lettuce, endive and batavia, and onions indicate the periods during which imports are normally permitted, but it must be understood by all importers that under the open licensing arrangements it may be necessary to stop the import of either commodity from any of the countries specified at any time.

Importers who already hold the appropriate open licences (prefix Nos. O.S.F. for Italy and O.F.F.V. for countries other than Italy) will be allowed, without amendment to their existing licences, to import the commodities mentioned both in this notice and in the previous notices from the countries named against each commodity.

Applications by importers not already in possession of such open licences should be submitted to the Ministry of Food, Fresh Fruit and Vegetables Division, Import Section, Carlton Hotel, Pall Mall, London, S.W. 1.

Price of Barley Sugar

The Chocolate, Sugar Confectionery and Cocoa Products (Control of Maximum Prices) Order, 1944, has been amended. This permits pharmacists to sell barley sugar ration-free against medical prescriptions at increased prices.

Food Mission to South Africa

In response to an invitation from the Government of the Union of South Africa, the Minister of Food has sent a mission to South Africa to discuss the 1949 programme of food imports from South Africa, with special regard to the terms of the Gold Loan Agreement between that country and the United Kingdom.

The mission, which left by air on October 19, consists of the following officials of the Ministry of Food: Mr. R. Herbert, Under-Secretary; Mr. C. H. Lewis, Director of Fresh Fruit and Vegetables; and Mr. R. Ecker, of the Canned Fish Division.

Cheese Importers

A list of firms who imported cheese from Norway and Sweden before the war is being compiled by the Ministry of Food. Any such firms who are not already in touch with the Ministry are invited to communicate with the Milk Products Division of the Ministry at London Road, Stanmore, Middlesex.

Nut Kernels Order

The Nut Kernels, 1947 (Amendment No. 2), Order, 1948, which came into force on October 17, 1948, provides for reduced maximum wholesale and retail prices for almond kernels and cashew kernels, and for reductions in the permitted additions for processing almond kernels. It also provides for a processing allowance for grinding cashew kernels.

The distribution of all nut kernels is still restricted to manufacturers and *bona fide* vegetarians.

Metallic Contamination of Foods

INVESTIGATIONS TO BE MADE

The Food Standards Committee, whose appointment was anounced by the Minister of Food in January, 1948, has set up a sub-committee to enquire into the metallic contamination of foods. The sub-committee is invited to consider:

(*a*) the available evidence of the effect of the ingestion of foods contaminated with metals or other injurious elements;

(*b*) the possibility of prescribing limits of contamination; and

(*c*) the technological problems which might arise from the prescription of such limits.

The following have agreed to serve on the sub-committee:

Mr. G. G. Barnes, Chairman.

Dr. L. E. Campbell, Director, British Food Manufacturing Industries Research Association.

Professor G. R. Cameron, University College Hospital Medical School.

Professor S. J. Cowell, Medical Research Council.

Dr. J. M. Johnston, Department of Health for Scotland.

Dr. W. P. Kennedy, Ministry of Health.

Dr. G. Roche Lynch, Senior Official Analyst, Home Office.

Dr. J. R. Nicholls, Department of the Government Chemist.

Mr. G. Taylor, Public Analyst.

Dr. G. W. Monier-Williams, formerly in charge of Food Research Laboratory, Ministry of Health.

The sub-committee is asking research associations, food processing firms, and medical and technical associations to co-operate in the enquiry. In particular the sub-committee wish to know:

(i) the metals and the foods which have been the subject of investigation;

(ii) the period covered by the investigation;

(iii) the units of measure used to express the degree of contamination;

(iv) the analytical method adopted.

Persons or organisations who are able to supply such data, and who have not already been approached, are invited to write to Mr. K. R. Allen, Secretary of the Food Standards Committee, at the offices of the Ministry of Food, Food Standards Division, Devonshire House, Mayfair Place, Piccadilly, London, W. 1.

White Fish for Quick Freezing

SPECIAL ALLOCATIONS TO BE MADE

It is the policy of the Ministry of Food to encourage the quick freezing of fish and to grant special allocations of fish for this purpose to those merchants who have equipment to produce quick frozen fish according to the standard prescribed by the Ministry.

Since the introduction of this policy in 1946 the quick freezing of fish industry has developed steadily. The future of the industry depends on the high standard of its production. It is essential, therefore, that all merchants who receive allocations of fish for quick freezing should pay particular attention not only to the efficiency of their plant but also to the selection of the fish and its subsequent handling in the frozen state.

Ideal conditions needed for the production and distribution of quick frozen fish are:

(*a*) Only fresh fish of best quality should be quick frozen.

(*b*) The delay between catching and quick freezing the fish should be as short as possible.

(*c*) The fish should be frozen at such a rate that the time taken to cool the fish from 32° F. to 23° F. does not exceed 2 hours, and the temperature of the fish leaving the freezing plant should not exceed 0° F.

(*d*) The frozen fish should be carefully "glazed" by immersion in or by spraying with cold water and/or sealed in moisture and vapour proof wrappers.

(*e*) The fish should be stored at uniform and adequately low temperatures as follows:

White Fish

Storage up to 4 months. Not higher than −5° F.
Storage up to 8 months. Not higher than −20° F.

Fatty Fish

Storage up to 3 months. Not higher than −5° F.
Storage up to 6 months. Not higher than −20° F.

Although quick freezers should aim at satisfying the conditions set out above, it may be difficult to comply with all of them at the present time. In the meantime, allocations of white fish for quick freezing will continue to be granted provided that:

(*a*) The plant is capable of cooling the fish from 32° F. to 23° F. in not more than two hours either when dealing with whole fish separately or in regularly shaped packs, or with packages of fillets in moulds, cardboard boxes or normal light wrappings of cellulose film, waxed paper, etc.

(*b*) When removed from the quick freezing plant no part of the fish is at a temperature higher than +10° F.

(*c*) Cold storage accommodation −10° F. or below is available on the same premises as the quick freezing plant or, where it is not at present possible to comply with this condition, alternative arrangements are provided which have been approved by the Ministry.

The quantity of fish allocated for quick freezing in any plant will be based upon the time taken to cool every part of a batch of fish from the temperature of the fish as delivered to the plant to at least +10° F., when the plant is operating under normal conditions.

De-control of Onion Prices

In view of the plentiful supplies of onions resulting from an exceptionally good home-grown crop, the control on prices of dry bulb onions has been removed as from October 6. At the same time control on prices of green (salad) onions was also removed in the hope that this would encourage growers to increase their plantings in time for the green onion crop next spring.

If in the new year prices become unreasonable, imported onions will be controlled at the same level as in the spring of this year.

The Order revoking the Onions Order, 1948, and the Green Onions Order, 1945, as amended, took effect on October 6, 1948.

Change of Address

The Oils and Fats Distribution Office (London and South-Eastern Divisions) of the Ministry of Food is now at the following address: Mayfair Court, Stratton Street, Piccadilly, London, W.1. Telephone: Regent 0924/8.

Meat Imports Freed

The Imported Meat, Canned Meat, and Pork (Requisitioning) (Revocation) Order, 1948, which revokes from October 10, 1948, three Requisitioning Orders which were made in 1939, has been published.

The original Orders were made primarily to give the Ministry of Food physical possession of meat and meat products arriving in the United Kingdom. One of the Orders, the Imported Canned Meat (Requisition) Order, 1939, also gave power to control overseas dealings in canned meats by British residents.

Supplies have now been safeguarded by the arrangements made by the Ministry with overseas supplying countries and none of the powers under these Orders is any longer required.

Knacker's Yard Order

The Knacker's Yard Order, 1948, which comes into force on December 19, 1948, implements certain recommendations made by the Bodinnar Committee which was set up to enquire into the methods by which livestock, meat, and poultry might be finding their way into consumption outside controlled channels.

Under the Order, occupiers of knackers' yards in England and Wales must hold licences granted by the Minister of Food in addition to licences to use the premises as knackers' yards granted by Local Authorities under the Food and Drugs Act, 1938.

The Order also requires occupiers of knackers' yards in England, Wales, and Scotland to keep records of the animals or carcases received into the yards and the manner of their disposal, and to furnish such information relating to the operations of the yard as may be prescribed by a notice served under the Order.

Applications for licences should be made immediately to the Ministry of Food, Meat and Livestock Division, Bryn Eurym, Colwyn Bay. These applications should give the name and address of the occupier of the yard, the address and description of the premises, and the name of the Local Authority by whom the premises are licensed for use as a knacker's yard.

Information and Advice

Chocolate Dragées and Sugared Almonds

B.2890. *We are experiencing difficulty in the manufacture of chocolate dragées and sugared almonds. Could you let us have a formula for the final coating of hard polish and the best way to apply it?* (Lancs.)

It is assumed that the sugared almonds have been processed correctly to the penultimate stage of filling, so that minute pinholes in the surface have been eradicated, and also that the almonds have been given a preliminary coating of gum solution to prevent exudation of the contained oil.

The efficiency of the polishing process, which follows, depends on the application of the final charges of syrup. The polishing of sugared almonds is carried out as follows:

A syrup of 30° Baumé is prepared and allowed to cool. The filled sugared almonds are placed in a clean dragée pan and given two or three charges of this syrup, each charge being allowed to dry completely before adding a further charge. Another three charges of syrup of diminishing density, 28° Baumé down to 26° Baumé, are added successively. During the final charge, which contains the delicate colouring, the pan is heated moderately, or a stream of warm air is passed by air duct into the pan until the almonds are uniformly warmed and just begin to dust. They are finally placed in trays, transferred to a warm stove at a temperature of 100° F. to 110° F., and allowed to dry. Obviously no powdered sugar should be added to the dragées in the polishing stage. The extremely thin coatings acquired by the dragées during this process derive from the syrups.

Dragées in process should be transferred to warm stoves overnight to prevent deposition of moisture on the pieces. Hot syrup should never be used, as this promotes cracking.

A formula for chocolate dragée glaze is as follows: Two lb. of gum benzoin are dissolved in sufficient alcohol to bring about a perfect solution, and 2 lb. of a sugar-cacao butter mixture (1:1) are added. This is warmed slightly to assist solution of the sugar and butter, a little more alcohol being added to thin if necessary. This glaze is carefully applied to the coated chocolate dragées in a clean pan, while cool, dry air is directed on the mass to assist drying. The dragées should be allowed to run until completely dry.

Information Supplied

B.2876. *Manufacturers of stitching machines or staplers for wire stitching cardboard outers.* (Lancs.)

B.2886. *Suppliers of pineapple slicing and processing plant.* (Mexico.)

B.2887. *Suppliers of bottles for packing lime juice cordial, orange squash, and lemon squash.* (British East Africa.)

B.2888. *Suppliers of soluble coffee for export.* (Gibraltar.)

B.2889. *Manufacturers of egg graders.* (Netherlands.)

B.2898. *Manufacturers of a solid edible oil.* (Yorks.)

B.2899. *Manufacturers of Wensleydale cheese.* (Yorks.)

B.2900. *Suppliers of bone treatment equipment and pressure cookers and manufacturers of potato crisps, salad dressing, and garlic sausage.* (London.)

B.2901. *Manufacturers of closures for jam jars.* (Glam.)

B.2902. *Manufacturers of continuous frying equipment suitable for the production of potato crisps.* (London.)

B.2903. *Manufacturers of industrial vacuum cleaning plant, dust extraction plant, etc.* (Sussex.)

B.2904. *Manufacturers of ice cream powders.* (Nyasaland.)

B.2905. *Manufacturers of equipment for soda fountains and ice cream bars.* (India.)

B.2906. *Suppliers of carton gumming and sealing machinery for cartons about 16 in. square.* (London.)

B.2907. *Manufacturers of a small electric bench saw, 230 volts A.C., suitable for use in a butcher's shop.* (Lancs.)

B.2911. *Suppliers of hand dispensers for filling cans with 1 oz. tomato purée before the fish are packed.* (Suffolk.)

B.2912. *Manufacturers of equipment for the production of potato crisps.* (Yorks.)

B.2913. *Suppliers of starch moulds for fondant goods and liquorice.* (Cyprus.)

B.2918. *Suppliers of whale meat for pies.* (Glam.)

B.2919. *Manufacturers of a small output labeller, automatic or semi-automatic, suitable for labelling 1 lb. and 2 lb. jam jars.* (Northern Ireland.)

B.2931. *Manufacturers of machinery to press out meat or fruit pie tops.* (Essex.)

B.2933. *Manufacturers of an electric crimping machine for sealing potato crisp bags.* (Lancs.)

B.2935. *Makers of continuous retorts and suppliers of machinery for making jellied eels.* (Yorks.)

B.2936. *Importers of olive oil and teaseed oil.* (Yorks.)

B.2939. *Manufacturers and exporters of phosphoric acid and machinery for making confectionery.* (British East Africa.)

B.2944. *Suppliers of celluloid tubes and containers.* (Lancs.)

B.2947. *Manufacturers of labelling machines for round tins.* (Notts.)

B.2949. *Manufacturers of a machine for making corrugated paper suitable for lining biscuit tins.* (Lancs.)

B.2951. *Manufacturers of refrigerating machinery.* (Spain.)

B.2953. *Suppliers of plant used in the manufacture of tomato purée.* (S. Africa.)

B.2954. *Names and addresses of export agencies.* (Sussex.)

B.2967. *Name and address of a firm making machinery for cleaning and de-hairing ox feet.* (Scotland.)

B.2969. *Producers of albumen concentrate from fish.* (Eire.)

B.2972. *Literature on the preparation of albumen from fish.* (Norway.)

Recent Patents

These particulars of new patents of interest to readers have been selected from the "Official Journal of Patents," and are published by permission of the Controller of H.M. Stationery Office. The journal can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, price 1s. weekly (annual subscription £2 10s.).

Specifications Published

Printed copies of the full Published Specifications may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, at the uniform price of 1s. each.

605,714. GOURMETS SOC. ANON.: Process for the manufacture of a coffee substitute from a cereal bran.

605,910. BIRTLE, S., and BUSWELL, F.: Apparatus for heat treatment of materials or the cooking of foodstuffs.

606,095. CHINOIN GYOGYSZER ES VEGYESZETI TERMEKEK GYARA R.T. (Dr. Kereszty and Dr. Wolf): Process for the production of vitamin B_1.

606,292. BROOKS, J., HAWTHORNE, J. R., and INGRAM, M.: Dried eggs.

606,304. AKTIESELSKABET STORD, and NOTEVARP, O.: Method of obtaining fat or oil, and feeding meal from fish, fish offal, and the like.

606,349. BRITISH SOYA PRODUCTS, LTD., and CLAY, C. F.: Soya beans and other seeds of high protein content.

Abstract of a Recent Specification

Drying of Fruit and Vegetables

This invention relates to the production of fruit and vegetable powders.

One of the objects of this invention is a simple, rapid, and economical process for making a dried granular or powdered fruit or vegetable product that will not become objectionably gummy during the process, and that will not form a caked mass after exposure to the atmosphere.

Other objects of the invention are an improved process for producing a high concentration of vitamins in a fruit or vegetable powder of very low moisture content, which powder will readily be restored to desired edible condition as a seasoning, food, or drink upon mixing with water; the production of a dry fruit or vegetable product which reacts to atmospheric moisture similarly to granulated sugar, in that any slight surface crust that might form immediately breaks up when agitated or stirred and becomes readily flowable in its original granular or powdery state; and the processing of fruits or vegetables from a fresh or conventionally dried condition (the latter resembling dried apricots, prunes, or the like) to a substantially bone-dry state in which the moisture content is less than 6 per cent. of the mass by weight, or from say 2 per cent. to 4 per cent., without exposure to air or heat and without subjecting the product to such conditions as would impair the vitamin content present at the commencement of the process. To accomplish this result the process herein is substantially one in which the product is conducted in an enclosed path of travel through the various steps and in which the evaporation of moisture is preferably accomplished in vacuum driers that form a part of the said path.

Tomatoes, berries, peaches, prunes, pears, mangoes, and guavas have been dried by this process with the uniform results of retention of the vitamins and the non-gumming characteristics mentioned with respect to apricots. The very fugitive or easily lost vitamin C is retained, and in so far as fruits are concerned, the process is very satisfactory using those kinds of fruit that are partially dried commercially in halves, slices, cubes, or the like, but in which there is too high a moisture content to form a powder. Prunes, pears, peaches, and nectarines are examples of such fruits.

605,700. *Kitchener Carl Newsom.*

Trade Marks

The list of trade marks of interest to readers has been selected from the "Official Trade Marks Journal" and is published by permission of the Controller of H.M. Stationery Office. The journal can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, price 1s. weekly (annual subscription £2 10s.).

PROTOLYSATE.—647,350. Food products containing an enzymic hydrolysate of protein. **Mead Johnson and Co.** (a corporation organised under the laws of the State of Indiana, United States of America), Ohio Street and St. Joseph Avenue, Evansville, State of Indiana, United States of America; Manufacturers.

DELMA.—647,769. Preserved fruits and preserved vegetables. **Delma Canning Company, Limited,** New Road, Pershore, Worcester; Manufacturers and Merchants.

FROOD.—648,633. Soups, meat, fish, poultry, game, vegetables, dairy produce (for food), meat extracts, vegetable extracts, jams, edible oils, edible fats, and preserves of meat, fruit, fish, and vegetables, all prepared for serving as meals and processed by freezing. **J. Lyons and Company, Limited,** Cadby Hall, Hammersmith Road, Kensington, London, W.14; Manufacturers and Merchants.

ST. GABRIEL - BRAND. — 650,6[illegible] Sardines in oil. **Ramirez e C[illegible] panhia, Limitada** (a limited liabil[illegible] company incorporated in Portug[illegible] 27, Rua Augusta, Lisbon, Portug[illegible] Manufacturers and Merchants.

ESROLKO. — 652,376. Flavour[illegible] (other than essential oils) for fo[illegible] and for beverages. **Esrolko Soci[illegible] Anonyme** (a corporation organised a[illegible] existing under the laws of Switz[illegible] land), Neugutstrasse 46, Dubendo[illegible] Zurich, Switzerland; Manufacturers.

MELLEEN. — 659,429. Jellies ([illegible] food) for use by bakers and conf[illegible] tioners. **Lawrence and Hilton, Ltd.**, 481, Waterloo Road, Blackpool, Lanc[illegible] Manufacturers.

New Companies

J. Wylie and Company, Limit[illegible] (455017.) To carry on business [illegible] manufacturers of and dealers in wine[illegible] spirits, liqueurs, cider, ales, and bee[illegible] of all kinds, minerals, cordials, et[illegible] Nom. cap.: £100 in £1 shares. Dir[illegible] to be appointed by subs. Subs[illegible] J. C. Cruttwell, 16, Glendon Garden[illegible] N.W.7 (clk.); I. Collins, 2, We[illegible] Heath Drive, N.W.11 (clk.).

J. H. Senior and Company (Hold[illegible] ings), Limited. (455239.) Raym[illegible] Park, S.W.20. To acquire the whol[illegible] of the issued share capital of J. H[illegible] Senior and Co., Ltd., and to carry o[illegible] business of manufacturers of food pr[illegible] serves, food condiments, etc. Nom[illegible] cap.: £150,000 in 2s. shares. Dir[illegible] not named. Subs.: C. J. Pollo[illegible] (clk.) and J. G. Hopton (solr.), [illegible] Old Jewry, E.C.2.

Goldcrops, Limited. (459427.) Ba[illegible] Chambers, 124, High Street, Dorkin[illegible] Surrey. To carry on business of ca[illegible] ners, packers, dealers, distributors, a[illegible] agents for the sale of fruit, vegetable[illegible] meat, etc. Nom. cap.: £2,000 in [illegible] shares. Dirs.: D. Sparks, 107, Highe[illegible] Drive, Banstead, Surrey; P. R. Sparks[illegible] Hillside, Cudworth, Newdigate, Surrey

Kenstan, Limited. (459458.) [illegible] Sandy Lane, Chorlton - cum - Hardy[illegible] Manchester. To carry on business [illegible] bakers, confectioners, pastrycooks[illegible] etc. Nom. cap.: £1,000 in £1 shares[illegible] Dirs.: K. R. Raper and H. S. Raper[illegible] Greenbank, Castle Lane, Prestbury[illegible] S. W. Crimes, 339, Bury New Road[illegible] Salford 7.

Eastbourne Cookery Service, Limited[illegible] (459600.) 183, Victoria Drive, East[illegible] bourne. To take over business of [illegible] manufacturer of cake and flour con[illegible] fectionery carried on as "Eastbourn[illegible] Cookery Service" by M. M. R. Parr[illegible] at 57, Seaside Road, Eastbourne[illegible] Nom. cap.: £2,000 in £1 shares[illegible] Permt. dirs.: M. M. R. Parry, [illegible] Astaire Avenue, Eastbourne; W. [illegible] Barge, 183, Victoria Drive, East[illegible] bourne.

Taken from the Daily Register, com[illegible]piled by Jordan and Sons, Limited[illegible] Company Registration Agents, [illegible] Chancery Lane, London, W.C. 2.

FOOD MANUFACTURE

INDEX TO VOLUME XXIII

JANUARY TO DECEMBER, 1948

SUBJECT INDEX

Editorial Comments are indicated by (Ed.).
Enquiries (Information and Advice) are indicated by (Enq.).
Notes and very brief articles are indicated by (N.).
Book Reviews are indicated by (Book).
Correspondence is indicated by (Corr.).
References to full-length articles are indicated by simple page numbers.

Abattoir, The Modern (N.), 507
Accounting in the Food Industry, Cost, Part II, 67; Part III, 279; Part IV, 377; Part V, 475; Part VI, 523
Acetic Acid Preserves, Part I, 168; Part II, 203; Part III, 270; Part IV, 309; Part V, 362
Acid:
  Ascorbic, in Fruit Processing, 551
  in Frozen Vegetables, Dehydroascorbic (N.), 355
  Preserves, Acetic, Part I, 168; Part II, 203; Part III, 270; Part IV, 309; Part V, 362
Advertising, Modern Trends in, 215
Agricultural:
  Iconoclasm (Book), 374
  Marketing, New Plans for, 25
  Research (N.), 14
  Revolution (Ed.), 351
Agriculture, Chemistry and (N.), 518
Almonds, Sugared, and Chocolate Dragées (Enq.), 583
Aluminium:
  in the Food Industry (N.), 267
  Scare (Ed.), 148
American Relief Plans, Wheat and (Ed.), 1
Analysis:
  Food, 153
  The Use of Scientific Instruments in Chemical, Part V, 61; Part VI, 179
Analyst's Book, The Food (Book), 521
Antioxidant, Carrot Oil as (Ed.), 100
Apple Shortage, Cider (Ed.), 399
Argentina's Oil and Fat Policy (Ed.), 255
Ascorbic Acid in Fruit Processing, 551
Athletes, How to Feed, 403
Atomic Age, Food and the (Ed.), 446
Australia, Suggestions from (Ed.), 255
Australian:
  Dried Fruits Industry, 470
  Farms, Bacon from (N.), 368
Automatic Control in Food Processing, Part I, 519; Part II, 563
Baby Foods at Greenford, 545
Bacon from Australian Farms (N.), 368
Bacteria and Frozen Vegetables (Ed.), 493
Bacteriology, Dairy (Book), 566
Bakers:
  A Warning to (Ed.), 100
  Advice to (N.), 567
  Broadcast (Ed.), 446
  Piping Jelly (Enq.), 299
  Question Minister of Food (Ed.), 97
  Remuneration (Ed.), 145
  Yeasts, Keeping Properties of Dried (Ed.), 447
Bakery:
  Cold Storage in the (Ed.), 146
  Industry, Irish (N.), 336
  Industry Research, 182
  Research (N.), 83, 565
Bakery (*continued*):
  Science in Italian, 101
  Travelling Oven Chains, Lubrication of, 417
Baking Industry, The, 263
Beef:
  DDT Content of (N.), 376
  from Hoof to Can, 276
Biscuit Industry, The Cake and (N.), 9
Black Puddings (Enq.), 443
Book Reviews:
  Aluminium and Aluminium Alloys in the Food Industry, 267
  Atlantic Isles, The, 567
  Biological Standardisation of Vitamins, The, 274
  Certain Aspects of the German Herring Canning Industry, 125
  Colony, The, 167
  Concise Chemical and Technical Dictionary, 178
  Dairy Bacteriology, 566
  Dining Round London, 167
  East African Groundnuts Scheme, 262
  Efficient Use of Steam, The, 507
  Elements of Fuel Technology, 426
  Elixirs of Life, 461
  Everyday Dietetics, 506
  Feeding the Human Family, 518
  Food Industries Manual, 76
  Fruit Annual and Directory, The, 550
  Fuel and the Future, 374
  Manufacturers' Practical Recipes, 413
  Methods of Vitamin Assay, 163
  Milk Production and Control, 328
  Milk Products, 328
  Nitrogen for Cereals, 472
  Nutrition and Diet Therapy, 407
  Nuts: Their Production and Everyday Uses, 512
  Official and Tentative Methods of Analysis of the Association of Official Agricultural Chemists, 521
  Packaging and Display Encyclopædia, 278
  Packaging Methods and Equipment, 410
  Physics of Drying in Heated Air with particular reference to Fruit and Vegetables, The, 367
  Plantation Crops, 327
  Poisons: Their Isolation and Identification, 410
  Power and Process Steam Engineering, 56
  Practice of Industrial Medicine, The, 428
  Preservation of Fruit and Vegetables by Freezing, The, 281
  Questions and Answers on Refrigeration, 515
  Refrigeration, 59
  Report of the Committee appointed to review the working of the Agricultural Marketing Acts, 25
  Report of the Food Investigation Board for the Years 1940-1946, 512
  Report of the Water Pollution Research Board, 335
  Restaurant Manual, 202
  Science and Nutrition, 22
  Science in Scotland, 130
  Thoughts on Feeding, 374
  Vegetable Oils and Oilseeds, 469
  Vogue's Contemporary Cookery, 181
  What's Wrong with your Factory, Office, or Works, 123
Books Received:
  33, 178, 205, 266, 361, 414, 462, 552
Bottling of Onions (Enq.), 443
Bread:
  Enrichment, Iron in (N.), 75
  Enrichment Legislation (Ed.), 302
  Improvers (Enq.), 299
  Making, Mechanised, 497
  Skim Milk Powder in (N.), 122
Brined Onions (Enq.), 539
British:
  Association at Brighton (N.), 476
  Food Machinery, World Wants (N.), 329
  Industries Fair, 1948, 239, 292
Cake and Biscuit Industry, The (N.), 9
Canine Hysteria (Ed.), 145
Canned:
  Foods, Insecticide Residues in (Ed.), 256
  Meats, Thermal Processing of (N.), 120
Cannery, Sea-going (Ed.), 544
Canning:
  Herring, 401
  in Eire, Fish (N.), 457
  in France, 375
  in Germany, Herring, 125
  in Norfolk, Vegetable and Fruit, 149
  in Suffolk, Fruit and Vegetable, 268
  Industry, Co-ordinated Process Control in the, 164
  Literature on Fish (Enq.), 95
  Pioneer, Britain's Food, 229
  Research, Fruit and Vegetable, 222
  Spray Residues and (Ed.), 495
Carrot Oil as Antioxidant (Ed.), 100
Cereal Chemistry, Twenty-one Years of, 221
Chains, Lubrication of Bakery Travelling Oven, 417
Cheese:
  Dry (Enq.), 47
  Wensleydale, 449
Chemical Analysis, The Use of Scientific Instruments in, Part V, 61; Part VI, 179
Chemical Methods for the Estimation of Vitamins, 316
Chemicals, Fish and (Ed.), 146
Chemist in the Flour Mill, The, 560
Chemistry and Agriculture (N.), 518

Cherries, Glacé (Enq.), 95
Chestnuts, Hot (Ed.), 4
Chocolate Dragées and Sugared Almonds (Enq.), 583
Chutney, Mango (Enq.), 539
Cider Apple Shortage (Ed.), 399
Ciders, Concentration by Freezing of Fruit Juices, Vinegars, and, 282
Citrus:
  Fruit Juices Control (N.), 462, 508
  Juice Concentrates, Vitamin C Content of (N.), 381
Cleaning Powders (Enq.), 47
Coal, Oil, and Gas (Book), 426
Coconut, Desiccated (Enq.), 251
Cold Storage:
  in the Bakery (Ed.), 146
  of Fruit and Vegetables, Short-term (N.), 238
Colonies, Food from the (N.), 209
Companies, New:
  48, 96, 144, 192, 252, 300, 348, 396, 444, 492, 540, 584
Concentrates, Vitamin C Content of Citrus Juice (N.), 381
Concentration by Freezing of Fruit Juices, Vinegars, and Ciders, 282
Condensation by "Squeeze-Drying," Milk (Ed.), 398
Confectionery:
  Industry, The, 53
  Industry, The Irish (N.), 76
  Then and Now, 223
Congress:
  French Milling (N.), 332
  Fruit Juice (N.), 336
Consultants in Industry (N.), 65
Container Industry, The Tin (N.), 60
Containers, Glass (Ed.), 148
Control:
  Citrus Fruit Juices (N.), 462, 508
  Dairy Practice and (Book), 328
  in Food Processing, Automatic, Part I, 519; Part II, 563
  in St. Marylebone, Food (Ed.), 543
  in the Canning Industry, Co-ordinated Process, 164
  of Jam Setting, Laboratory, 455
Cookery, Contemporary (Book), 181
Copra, The Boom in, 509
Correspondence:
  267, 364, 414
Cost Accounting in the Food Industry, Part II, 67; Part III, 279; Part IV, 377; Part V, 475; Part VI, 523
Cracked Cups, Food, Nail Varnish and (Ed.), 541
Cream Fillings (Enq.), 47
Crop, A New (Ed.), 302
Crops:
  Nitrogen and its Effect on (N.), 472
  Trade, Plantation (Book), 327
Culture Collections of Micro-organisms (N.), 83
Curing:
  More Pigs for (Ed.), 194
  of Herrings, Recent Experiments in the Salt, 465
Dairy:
  Bacteriology (Book), 566
  Durham's New, 365
  Practice and Control (Book), 328
DDT Content of Beef (N.), 376
Dehydrated:
  Meat, Packaging (N.), 430
  Vegetables (N.), 262
Dehydroascorbic Acid in Frozen Vegetables (N.), 355
Desiccated Coconut (Enq.), 251
Dictionary, A Technical (Book), 178
Diesel Engine in the Factory, The, 176
Diet:
  and Disease, 553
  Therapy (Book), 407
Dietetics, Popular (Book), 506
Disease, Diet and, 553
Display, Packaging and (Book), 278
Dried:
  Bakers' Yeasts, Keeping Properties of (Ed.), 447
  Fruit Fears (Ed.), 254
  Fruits Industry, Australian, 470
Drying of Fruit and Vegetables (Book), 367
Dust Problems in Flour Milling (N.), 525
East Malling, Work at (N.), 181
Eating Out (Book), 202
Edible:
  Flour from Oilcake, Part I, 513
  Gelatine Manufacture, 197
Egg:
  Tester, Electronic (N.), 106
  White Protein Best of All (N.), 548
Eire:
  Fish Canning in (N.), 457
  More Food from (Ed.), 349
  Potential Food Resources in, 70
  The Food Group Visits, 313
Eire's First Hydrogenation Plant, 408
Electricity Revolutionises Fish Oil Extraction Methods, 516
Electrometric Measurement of *p*H, The, 369
Electronic:
  Egg Tester (N.), 106
  Instruments in the Sugar Industry, 113
  Preservation of Foods, 549
Engineering, Factory (Book), 56
Enrichment:
  Iron in Bread (N.), 75
  Legislation, Bread (Ed.), 303
  of Flour Qualities (N.), 120
Europe's Fat Supplies (N.), 75
Export Guarantees Scheme, The (Ed.), 398
Factory:
  Engineering (Book), 56
  Expansion, Sugar (Ed.), 397
  Organisation and Management (Book), 123
  The Diesel Engine in the, 176
Farming will Ease Food Shortage, Better (Ed.), 493
Fat:
  Policy, Argentina's Oil and (Ed.), 255
  Supplies, Europe's (N.), 75
Fats in Human Nutrition, Part I, 356; Part II, 423
Fertiliser, More Food, More (Ed.), 400
Fertilising the Sea (Ed.), 51
Fillings, Cream (Enq.), 47
Films in Industry (Ed.), 147
Final Report on Patents, The, 237
Fish:
  and Chemicals (Ed.), 146
  and Chips (Ed.), 544
  Canning in Eire (N.), 457
  Canning, Literature on (Enq.), 95
  Gas-stored (N.), 69
  Oil Extraction Methods, Electricity Revolutionises, 516
  Oils (Ed.), 49
  Paste Manufacture (Corr.), 267
Fishery Industries of North America, The, Part I, 171; Part II, 206; Part III, 257; Part IV, 323; Part V, 359
Fishing Industry, Nationalisation of the (Ed.), 2
Flash Freezing of Foods, 503
Flavour of Meat (Ed.), 448
Flour:
  from Oilcake, Edible, Part I, 513
  Industry, German Grain and (N.), 368
  Mill, The Chemist in the, 560
  Milling, Dust Problems in (N.), 525
  Qualities, Estimation of (N.), 120
  The Treatment of, 227
Food:
  Analysis, 153
  Analyst's Book, The (Book), 521
  and the Atomic Age (Ed.), 446
  Anticipations (N.), 124
  Bakers Question Minister of (Ed.), 97
  Canning Pioneer, Britain's, 229
  Control in St. Marylebone (Ed.), 543
  from Eire, More (Ed.), 349
  from the Colonies (N.), 209
Food (*continued*):
  from Vegetable Wastes, 427
  Frozen, Sales (Ed.), 194
  Glycerine and (N.), 502
  Group visits Eire, The, 313
  in the Faroes (Book), 567
  Industries and the Postage Stamp, 66
  Industry, Aluminium in the (N.), 267
  Industry, Cost Accounting in the, Part II, 67; Part III, 279; Part IV, 377; Part V, 475; Part VI, 523
  Infection Campaign (Ed.), 304
  Insecticide Residues in Canned (Ed.) 256
  Laws, Social History of the Pure, Part II, 11
  Machinery, World Wants British (N.), 329
  Manufacture, Polish (N.), 34
  Manufacturer's Handbook, A (Book), 76
  Nail Varnish, and Cracked Cups (Ed.), 541
  Packaging, 233
  Plant Hygiene, 333
  Plant Position Obscure (Ed.), 541
  Poisoning, Staphylococcus (Ed.), 50
  Preservation Advances (Ed.), 350
  Preservative, Vitamin K_3 as a (Ed.), 494
  Processing, Advances in, 220
  Processing, Automatic Control in, Part I, 519; Part II, 563
  Processing Developments (N.), 550
  Processing, Photoelectricity in (Ed.), 495
  Products, Saltiness in (Ed.), 99
  Prospects (Ed.), 49
  Protection (N.), 422
  Resources in Eire, Potential, 70
  Science, Advances in (Book), 512
  Shortage, Better Farming will Ease (Ed.), 493
  Supplies, Britain's, 71
  Supplies, Schemes for Increasing World (Ed.), 301
  The Parasitic Animal and (Ed.), 195
  Transport by Sea (N.), 157
Foods:
  Electronic Preservation of, 549
  Flash Freezing of, 503
  in Suffolk, Quick Freezing of, 353
France, Canning in, 375
Freezing:
  of Foods, Flash, 503
  of Foods in Suffolk, Quick, 353
  of Fruit Juices, Vinegars, and Ciders, Concentration by, 282
  Preservation of Fruit Juices, 405
French Milling Congress (N.), 332
Frozen:
  Food Sales (Ed.), 194
  Vegetables, Bacteria and (Ed.), 493
  Vegetables, Dehydroascorbic Acid in (N.), 355
Fruit:
  and Vegetable Canning in Norfolk, 14
  and Vegetable Canning in Suffolk, 20
  and Vegetable Canning Research, 22
  and Vegetable Preservation (N.), 111; (Book), 281
  and Vegetable Research, 459
  and Vegetables, Drying of (Book), 36
  and Vegetables, New Process for Peeling (Ed.), 195
  and Vegetables, Short-term Cold Storage of (N.), 238
  Juice—A New Development (Ed.), 54
  Juice Congress (N.), 336
  Juices Control, Citrus (N.), 462, 508
  Juices, Freezing Preservation of, 405
  Juices, Vinegars, and Ciders, Concentration by Freezing of, 282
  Processing, Ascorbic Acid in, 551
  Syrup Preparation (N.), 60
  Trade, The World (Book), 550
Fruits:
  Industry, Australian Dried, 470
  of Honduras (Ed.), 301

Fuel should be Used, How (Book), 374
Gas, Coal, Oil, and (Book), 426
Gas-stored Fish (N.), 69
Gelatine Manufacture, Edible, 197
German Grain and Flour Industry (N.), 368
Germany, Herring Canning in, 125
Glacé Cherries (Enq.), 95
Glass Containers (Ed.), 148
Glaxo Factory, 545
Glutamate, Monosodium (N.), 335
Glycerine and Food (N.), 502
Grain:
  and Flour Industry, German (N.), 368
  Outlook, World (Ed.), 349
Groundnuts Scheme, The (N.), 262
Growth-Promoting Substance, A New, 477
Handling and Transport of Meat (N.), 64
Herbs, Curious (Book), 461
Herring:
  Canning, 401
  Canning in Germany, 125
  Shoal Location (Ed.), 4
Herrings, Recent Experiments in the Salt Curing of, 465
Honey Bar, Malt and (Enq.), 191
Hop Production in South Africa, 463
Hydrogenation Plant, Eire's First, 408
Hygiene, Food Plant, 333
Hysteria, Canine (Ed.), 145
Ice Cream (Enq.), 143, 347
Improvers, Bread (Enq.), 299
Industrial Medicine (Book), 428
Infection:
  Campaign, Food (Ed.), 304
  Malnutrition and Resistance to, 505
Insecticide Residues in Canned Foods (Ed.), 256
Instruments in the Sugar Industry, Electronic, 113
Irish:
  Bakery Industry (N.), 336
  Confectionery Industry, The (N.), 76
Iron in Bread Enrichment (N.), 75
Italian Bakery, Science in, 101
Jam:
  Setting, Laboratory Control of, 455
  Today (Ed.), 448
Jelly, Bakers' Piping (Enq.), 299
Keeping Properties of Dried Bakers' Yeasts (Ed.), 447
Laboratory:
  Control of Jam Setting, 455
  Layout and Construction, 473
Laws, Social History of the Pure Food, Part II, 11
Lecithin, Vegetable, 330; (Corr.), 414
Legislation, Bread Enrichment (Ed.), 303
Liquors, Sulphite (Ed.), 51
Low Temperature Research Station, Cambridge, The, 219
Lubrication of Bakery Travelling Oven Chains, 417
Machinery:
  Poultry for Table by, 305
  World Wants British Food (N.), 329
Malnutrition and Resistance to Infection, 505
Malt and Honey Bar (Enq.), 191
Man Power (Corr.), 364
Management, Factory Organisation and (Book), 123
Mango Chutney (Enq.), 539
Manufacture:
  Edible Gelatine, 197
  Fish Paste (Corr.), 267
  Polish Food (N.), 34
  Recovery, Milk (Ed.), 447
Manufacturer's Handbook, A Food (Book), 76
Margarine through the Years, 218
Marketing, New Plans for Agricultural, 25
Mashed Potato Powder Litigation (N.), 426
Maté, Yerba (Ed.), 3
Mayonnaise and Related Products, 118
Measurement of *p*H, The Electrometric, 369
Meat:
  Flavour of (Ed.), 448
Meat (*continued*):
  Handling and Transport of (N.), 64
  Packaging Dehydrated (N.), 430
  Palatability of (N.), 105
  Target, The Pig (Ed.), 97
  The Tryptophan Content of (Ed.), 352
Meats, Thermal Processing of Canned (N.), 120
Mechanised Bread Making, 497
Medicine, Industrial (Book), 428
Methods:
  for the Estimation of Pectin, 77
  for the Estimation of Vitamins, Chemical, 316
Micro-organisms, Culture Collections of (N.), 83
Milk:
  Condensation by "Squeeze-Drying" (Ed.), 398
  Manufacture Recovery (Ed.), 447
  Powder in Bread, Skim (N.), 122
Milling:
  Congress, French (N.), 332
  Dust Problems in Flour (N.), 525
  Industry, The, 5
Ministry of Food, Statutory Rules and Orders:
  10, 84, 117, 175, 202, 278, 312, 364, 413, 458, 522, 556
Modern Nutrition (Book), 22
Monosodium Glutamate (N.), 335
Mushroom Soup without Mushrooms (Ed.), 399
Nationalisation of the Fishing Industry (Ed.), 2
Nitrogen and its Effect on Crops (N.), 472
Norfolk, Vegetable and Fruit Canning in, 149
North America, The Fishery Industries of, Part I, 171; Part II, 206; Part III, 257; Part IV, 323; Part V, 359
Norwegian Whalemeat Production, 15
Nutrients and Vitamin C, Plant (Ed.), 494
Nutrition:
  Fats in Human, Part I, 356; Part II, 423
  in Britain, Present Day, 29
  Modern (Book), 22
Nuts, All About (Book), 512
Odour and Oxidisability, 411
Oil:
  A New Vegetable (Ed.), 147
  and Fat Policy, Argentina's (Ed.), 255
  and Gas, Coal (Book), 426
  as Antioxidant, Carrot (Ed.), 100
  Extraction Methods, Electricity Revolutionises, 516
  in South Africa, Refining Seal (N.), 9
  Sunflower, 57
Oilcake, Edible Flour from, Part I, 513
Oils:
  Fish (Ed.), 49
  Vegetable (Book), 469
Onions:
  Bottling of (Enq.), 443
  Brined (Enq.), 539
Organisation and Management, Factory (Book), 123
Oven Chains, Lubrication of Bakery Travelling, 417
Oxidisability, Odour and, 411
Packaging:
  and Display (Book), 278
  Dehydrated Meat (N.), 430
  Food, 233
  Methods and Equipment (Book), 410
  Standardisation of (N.), 106
Palatability of Meat (N.), 105
Panettone: Science in Italian Bakery, 101
Parasitic Animal and Food, The (Ed.), 195
Patents, Recent:
  48, 96, 144, 192, 252, 300, 348, 396, 444, 492, 540, 584
Patents, The Final Report on, 237
Pectin:
  Methods for the Estimation of, 77
  Precipitation of (Enq.), 251
  The Estimation of (Corr.), 364, 414
Peel-curing Process (Enq.), 491
Peeling Fruit and Vegetables, New Process for (Ed.), 195
*p*H, The Electrometric Measurement of, 369
Photoelectricity in Food Processing (Ed.), 495
Piccalilli (Enq.), 395
Pig Meat Target, The (Ed.), 97
Pigs for Curing, More (Ed.), 194
Piping Jelly, Bakers' (Enq.), 299
Plant:
  Eire's First Hydrogenation, 408
  Hygiene, Food, 333
  Nutrients and Vitamin C (Ed.), 494
  Wear and Tear Replacement of (N.), 524
Plantation Crops Trade (Book), 327
Poisoning, Staphylococcus Food (Ed.), 50
Poisons and their Detection (Book), 410
Polish Wood Manufacture (N.), 34
Pollution, Water (Book), 335
Popcorn Study (Ed.), 148
Popular Dietetics (Book), 506
Potato Powder Litigation, Mashed (N.), 426
Poultry for Table by Machinery, 305
Powders, Cleaning (Enq.), 47
Preservation:
  Advances, Food (Ed.), 350
  Fruit and Vegetable (N.), 112, 281
  of Foods, Electronic, 549
  of Fruit Juices, Freezing, 405
Preservative, Vitamin K_3 as a Food (Ed.), 494
Preserves, Acetic Acid, Part I, 168; Part II, 203; Part III, 270; Part IV, 309; Part V, 362
Process:
  for Peeling Fruit and Vegetables, New (Ed.), 195
  Peel-curing (Enq.), 491
Processing:
  Advances in Food, 220
  Ascorbic Acid in Fruit, 551
  Automatic Control in Food, Part I, 519; Part II, 563
  Developments, Food (N.), 550
  of Canned Meats, Thermal (N.), 120
  Photoelectricity in Food (Ed.), 495
Products:
  Mayonnaise and Related, 118
  Saltiness in Food (Ed.), 99
Proteins, The Quality of, 127
Public Accounts Criticism (Ed.), 445
Publishing, Twenty-five Years of, 211
Puddings, Black (Enq.), 443
Pure Food Laws, Social History of the, Part II, 11
Quick Freezing of Foods in Suffolk, 353
Quo Vadis, 225
Recent Experiments in the Salt Curing of Herrings, 465
Recipes and Processes (Book), 413
Refining Seal Oil in South Africa (N.), 9
Refrigeration:
  Data in a Nutshell (Book), 515
  Its Principles and Applications (Book), 59
Replacement of Plant, Wear and Tear or (N.), 524
Research:
  Agricultural (N.), 14
  Bakery (N.), 83, 565
  Bakery Industry, 182
  Fruit and Vegetable, 459
  Fruit and Vegetable Canning, 222
  Institutions, Scottish (Book), 130
  Seaweed (N.), 122
Resistance to Infection, Malnutrition and, 505
Retrospect 1927 to 1948, 217
Salt Curing of Herrings, Recent Experiments in the, 465
Saltiness in Food Products (Ed.), 99
S.C.I. in Edinburgh, The, 415
Science:
  Advances in Food (Book), 512
  and the World Larder (Book), 518
  in Italian Bakery, 101
Scottish Research Institutions (Book), 130

Seal Oil in South Africa, Refining (N.), 9
Seaweed Research (N.), 122
Shoal Location, Herring (Ed.), 4
Short-term Cold Storage of Fruit and Vegetables (N.), 238
Skim Milk Powder in Bread (N.), 122
Social History of the Pure Food Laws, Part II, 11
Soup without Mushrooms, Mushroom (Ed.), 399
South Africa:
  Hop Production in, 463
  Refining Seal Oil in (N.), 9
Sponge Mixtures (Enq.), 395
Spray Residues and Canning (Ed.), 495
"Squeeze-Drying," Milk Condensation by (Ed.), 398
Standardisation:
  of Packaging (N.), 106
  Vitamin, 274
Staphylococcus Food Poisoning (Ed.), 50
Steaks, Turkey, 121
Steam, How to use (Book), 507
Storage Damage, Detection of (Ed.), 99
Suffolk, Quick Freezing of Foods in, 353
Sugar:
  and Teeth (Ed.), 194
  Factory Expansion (Ed.), 397
  Industry, Electronic Instruments in the, 113
  Review, 1947 (Ed.), 51
Sugared Almonds and Chocolate Dragées (Enq.), 583
Sulphite Liquors (Ed.), 51
Sunflower Oil, 57
"Super-pig" Again, the (Ed.), 99
Sweetening Agents, New, 380
Teeth, Sugar and (Ed.), 194
Therapy, Diet (Book), 407
Thermal Processing of Canned Meats (N.), 120
Tin Container Industry, The (N.), 60
Tomato Juice, 158
Trace Nutrients in Cow Manure, Unknown (N.), 548
Trade, Plantation Crop (Book), 327
Trade Marks:
  48, 96, 144, 192, 252, 300, 348, 396, 444, 492, 540, 584
Training within Industry (Ed.), 50
Transport:
  by Sea, Food (N.), 157
  of Meat, Handling and (N.), 64
Travelling Oven Chains, Lubrication of Bakery, 417
Tryptophan Content of Meat, The (Ed.), 352
Turkey Steaks, 121
Twenty-first Birthday Supplement, 210
Twenty-five Years of Publishing, 211
Twenty-one Years of Cereal Chemistry, 221
Twenty-one Years of Collaboration, 214
Vegetable:
  and Fruit Canning in Norfolk, 149
  Canning in Norfolk, Fruit and, 268
  Canning Research, Fruit and, 222
  Lecithin, 330; (Corr.), 414
  Oil, A New (Ed.), 147
  Oils (Book), 469
  Preservation, Fruit and (N.), 112
  Research, Fruit and, 459
  Wastes, Food from, 427
Vegetables:
  Bacteria and Frozen (Ed.), 493
  Dehydrated (N.), 262
Vegetables (*continued*):
  Dehydroascorbic Acid in Frozen (N.), 355
  Drying of Fruit and (Book), 367
  New Process for Peeling Fruit and (Ed.), 195
  Short-term Cold Storage of Fruit and (N.), 238
Vegetarian Cult, The, 429
Vinegar, Non-brewed (Ed.), 147
Vinegars, and Ciders, Concentration by Freezing of Fruit Juices, 282
Vitamin:
  Assay (Book), 163
  A, Protecting (Ed.), 542
  A Synthesised, 23
  C Content of Citrus Juice Concentrates (N.), 381
  C Plant Nutrients and (Ed.), 494
  K_3 as a Food Preservative (Ed.), 494
  Standardisation, 274
Vitamins:
  Chemical Methods for the Estimation of, 316
  Resurgent (Ed.), 352
  The, 107
Water Pollution (Book), 335
Wear and Tear or Replacement of Plant (N.), 524
Wensleydale Cheese, 449
Whalemeat Production, Norwegian, 15
Wheat:
  Agreement (Ed.), 193
  Agreement, The (Ed.), 397
  and American Relief Plans (Ed.), 1
Yeasts, Keeping Properties of Dried Bakers' (Ed.), 447
Yerba Maté (Ed.), 3

AUTHOR INDEX

Adlem, E. L.:
  Food Industries and the Postage Stamp, 66
Amos, A. J.:
  The Milling Industry, 5
Appleby, H. C.:
  The Diesel Engine in the Factory, 176
Arup, P. S.:
  Margarine Through the Years, 218
Backes, J. V.:
  Quo Vadis?, 225
Booth, V. H., Harris, L. J., Mapson, L. W., Kodicek, E., and Moore, T.:
  Chemical Methods for the Estimation of Vitamins, 316
Burrell, J. R.:
  Acetic Acid Preserves, Part I, 168; Part II, 203; Part III, 270; Part IV, 309; Part V, 362
Butterworth, S. W.:
  The Baking Industry, 263
Bywaters, H. W.:
  Confectionery Then and Now, 223
Callow, E. H.:
  The Low Temperature Research Station, Cambridge, 219
Cameron, I.:
  Laboratory Control of Jam Setting, 455
Cass, W. G.:
  Edible Flour from Oilcake, Part I, 513
Crosbie-Walsh, T.:
  Twenty-one Years of Collaboration, 214
Cruess, W. V.:
  Freezing Preservation of Fruit Juices, 405
  Tomato Juice, 158
Cuthbertson, D. P.:
  The Quality of Proteins, 127
Deschreider, A. R., and Van Den Driessche, S.:
  Methods for the Estimation of Pectin, 77
Dugdale, H.:
  Cost Accounting in the Food Industry, Part II, 67; Part III, 279; Part IV, 377; Part V, 475; Part VI, 523
England, F.:
  Food Packaging, 233
Erroll, F. J.:
  Electronic Preservation of Foods, 549
Fairbrother, T. H.:
  Retrospect 1927 to 1948, 217
Freeborn, A. S.:
  The Electrometric Measurement of *p*H, 369
Gane, R.:
  Concentration by Freezing of Fruit Juices, Vinegars, and Ciders, 282
Glover, J. H.:
  The Use of Scientific Instruments in Chemical Analysis, Part V, 61; Part VI, 179
Grover, D. W.:
  Food Analysis, 153
Harris, L. J., Mapson, L. W., Kodicek, E., Moore, T., and Booth, V. H.:
  Chemical Methods for the Estimation of Vitamins, 316
Herd, C. W.:
  The Treatment of Flour, 227
Hirst, F.:
  Fruit and Vegetable Canning Research, 222
Hunwicke, R. F.:
  Advances in Food Processing, 220
Ingram, M.:
  Norwegian Whalemeat Production, 15
Kenny, R. L.:
  The Confectionery Industry, 53
Kent-Jones, D. W.:
  Twenty-one Years of Cereal Chemistry, 221
Kidson, A. L.:
  The Boom in Copra, 509
Kodicek, R., Harris, L. J., Mapson, L. W., Moore, T., and Booth, V. H.:
  Chemical Methods for the Estimation of Vitamins, 316
Le Gros Clark, F.:
  Social History of the Pure Food Laws, Part II, 11
Lovern, J. A.:
  The Fishery Industries of North America, Part I, 171; Part II, 206; Part III, 257; Part IV, 323; Part V, 359
Mapson, L. W., Harris, L. J., Kodicek, E., Moore, T., and Booth, V. H.:
  Chemical Methods for the Estimation of Vitamins, 316
Martin, G.:
  Australian Dried Fruits Industry, 470
Moncrieff, R. W.:
  Odour and Oxidisability, 411
Moore, T., Mapson, L. W., Harris, L. J., Kodicek, E., and Booth, V. H.:
  Chemical Methods for the Estimation of Vitamins, 316
Paterson, E. V.:
  Lubrication of Bakery Travelling Oven Chains, 417
Robinson, F. A.:
  The Vitamins, 107
Schauder, R.:
  Hop Production in South Africa, 463
Schofield, M.:
  The Vegetarian Cult, 429
Shewan, J. M.:
  Recent Experiments in the Salt Curing of Herrings, 465
Tritton, S. M.:
  Mayonnaise and Related Products, 118
Van Den Driessche, S., and Deschreider, A. R.:
  Methods for the Estimation of Pectin, 77
Waddington, F.:
  Modern Trends in Advertising, 215
Walter, L.:
  Automatic Control in Food Processing, Part I, 519; Part II, 563

FOOD MANUFACTURE

HILL LIMITED 17 STRATFORD PLACE LONDON W.1 DECEMBER 1

e Most Important Thing next to the Products is the

PACKAGING

DECIDE ON MONO

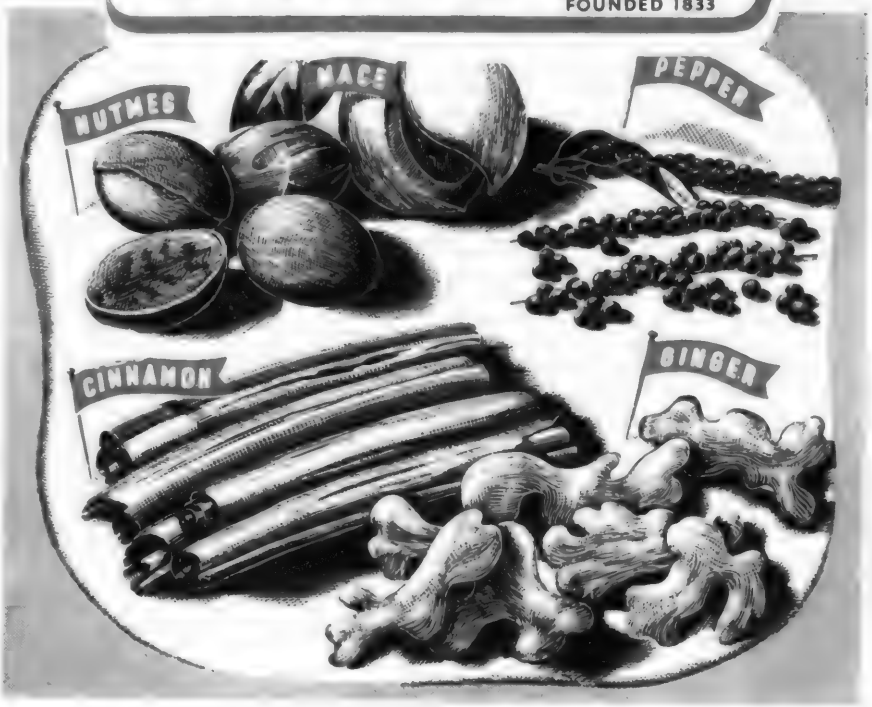
Yes, make no mistake about it, the pack's the thing that counts on the sales counter. An attractively styled, hygienic MONO CONTAINER will win quicker customer response. Ideal for a host of peace-time products, including Foodstuffs, Dairy Products and Pharmaceutical Preparations. We are now ready to offer suggestions and submit designs for MONO CONTAINERS to meet the special requirements of the Food and Allied Trades. Your enquiries are invited.

MONO *means* BUSINESS!

NO CONTAINERS LTD., CUMBERLAND AVENUE, PARK ROYAL, LONDON, N.W.10 TEL.: ELGAR 4044 (8 lines)

StaffAllenS

FOUNDED 1833



Ground Spices

GINGERS, PEPPERS, NUTMEG,
PIMENTO, MACE, CINNAMON,
MIXED SPICE, CLOVE, etc., etc.

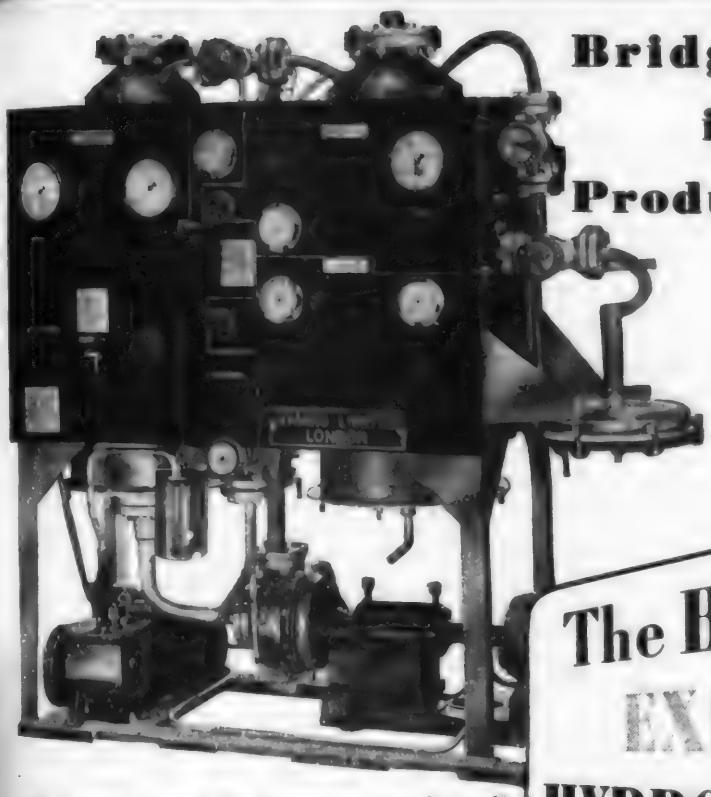
May we have your enquiries?

STAFFORD ALLEN & SONS LTD. Wharf Road. London. N.1. 'Phone CLErkenwell 1000 (7 lin

TAS/ALL

E734

Bridging the gap in your Production Chain



The BAMAG EXPRESS HYDROGENATOR

The Bamag Express Hydrogenator pays for itself many times over by converting liquid oils and fatty acids into Stearine and similar products in a matter of minutes. The plant is manufactured in standard sizes down to a capacity of 30 lb. per charge and its operation is simple. It will definitely solve your hard fat supply problem.

The Oils and Fats Division of Bamag Limited provide complete production plant for:

- Solvent Extraction
- Lecithin Recovery
- Refining
- Deodorising
- Fat Hardening for manufacture of Margarine, Shortening, etc.
- Electrolytic Hydrogen Production
- Salad Oil Production
- Vegetable Ghee Production
- Complete Whale and Fish Oil Processing Plant
- Preparation of Canning Oils from Herring Oil, and other processes

Continuous, semi-continuous or batch methods are available. Full performance guarantees.

Clients' services the world over. Write now for fuller details:

BAMAG LIMITED

The Chemical Engineers for Complete Food Installations

RICKETT STREET, LONDON, S.W.6

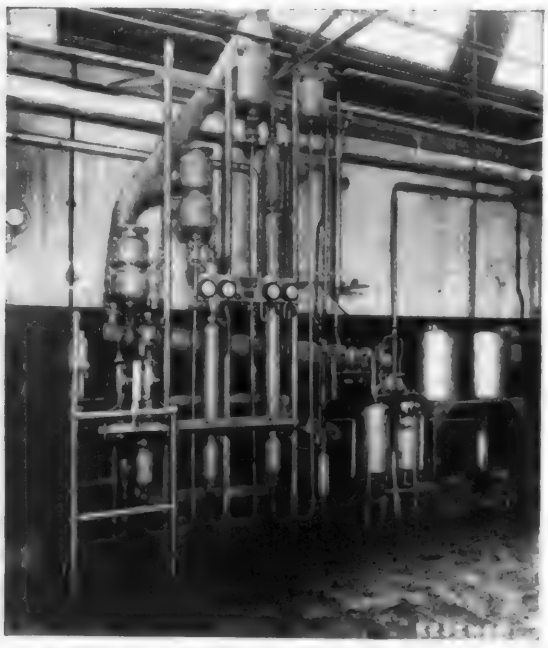
Phone: Fulham 7761 **Grams: Bamag, Walgreen, London**

EXPORT SERVICE: Universal House, 60 Buckingham Palace Road, London, S.W.1

Phone: SLOane 9282 **Grams: Bamag, Sowest, London**

Index to ADVERTISERS

	Page
Adams, Alfred & Co., Ltd	lxxvii
Adelphi Mnfg. Co., Ltd.	xcii
Aerosols, Ltd.	liv
Advita, Ltd.	lxx, xciv
A.G.M. & Co., Ltd.	xcii
Agricultural & Chemical Products, Ltd.	cx
Airmec Laboratories	
Albright & Wilson	xliii
Albro Fillers & Engg. Co., Ltd.	lviii
Alfa-Laval & Co., Ltd.	
Alite Patent Machine Co., Ltd.	
Allen, Stafford, & Sons, Ltd.	Cover ii
Alliance Box Co., Ltd.	
A.P.V. Co., Ltd.	
Ascot Gas Water Heaters, Ltd.	lxxvii
Associated Metal Works, Ltd.	xcvi
Associated Phosphate Mnfrs., Ltd.	lxxix
Automatic Weighing & Packing Co.	lxxxiv
Baldwin Instrument Co., Ltd.	lxiv
Bamag, Ltd.	iii
Barnett & Foster, Ltd.	xxiv
Bartlett, G. F., & Son, Ltd.	
Bastian & Allen, Ltd.	lxxxvii
Bawn, W. B., & Co., Ltd.	
B.C.B. Pallet Co., Ltd.	lxxxvi
Bear Honey Co., Ltd.	c
Benjamin Electric, Ltd.	
Bennett, Sons, & Shears, Ltd.	
Blandola Co., Ltd.	
Boehm, Frederick, Ltd.	lxii, cxiv
Boydell, E., & Co., Ltd.	cviii
Boxfoldia, Ltd.	xcviii
Brandt, Richard, & Co., Ltd.	
Branwell, Arthur, & Co., Ltd.	
Brewer's Foods Supply Co., Ltd.	xcviii
Bridges, S. N., & Co., Ltd.	xxx
Brierley, Wm., Collier, & Hartley, Ltd.	xcvii
Bristol's Instrument Co., Ltd.	
Britannia Folding Box Co., Ltd.	xc
British Duplex Seals, Ltd.	
British Fermentation Products, Ltd.	xcvii
British Gas Council	
British Nylon Spinners, Ltd.	xcv
British Railways	lxxxix
British Ratin Co., Ltd.	
British Steam Specialties, Ltd.	xc
British Thomson-Houston Co., Ltd.	xlix
British Vacuum Cleaner & Engg. Co., Ltd.	lii
British Wedge Wire Co., Ltd.	lxxx
Broadbent, Thomas, & Sons, Ltd.	viii
Brown & Forth, Ltd.	
Bryan, Wm.	cxiii
Bulmer, H. P. & Co., Ltd.	xxxvii
Burnett & Rolfe, Ltd.	xciii
Busby, Winter & Co., Ltd.	xciv
Bush, W. J., & Co., Ltd.	
Butterfield, W. P., Ltd.	lxvii
Caleb Duckworth, Ltd.	xciii
Calfos, Ltd.	vii
Cambridge Instrument Co., Ltd.	
Camerer Cuss	xcviii
Canning Town Glass Works, Ltd.	lxxx
Cannon Iron Foundries, Ltd.	lxxxvii
Chamberlain & Willows	cviii
Chemicals & Essential Oils, Ltd.	xci
Choices Library	cvi
Clariloid Chemical Co., Ltd.	cix
Clark, T. & C., Ltd.	
Cleveland Product Co., Ltd.	cvi
Collis, J., & Sons, Ltd.	lvii
Commer Cars, Ltd.	lix
Container Recovery Service	xiv
Cox & Danks, Ltd.	lxvi
Creamery Package Mnfg. Co., Ltd.	ix
Crofts, Ltd.	lxxxviii
Cumming, Parsons, Ltd.	lii
Cyclo Chemicals, Ltd.	lvi
Davies, W. James (Enterprises), Ltd.	lxxx
Davis Gelatine, Ltd.	lxxx
Dawson Brothers, Ltd.	
Dehydration Equipment, Ltd.	cvi
De La Rue, Ltd.	
Diamond Motors, Ltd.	lxxxii
Distillers Co., Ltd., The	
Dodge Brothers (Britain), Ltd.	xlii
Drayton Reg. & Inst'm't Co., Ltd., The	Cover iii
Dublin Chemical Co., Ltd.	civ
Dubuis & Rowsell, Ltd.	xlviii
Duche & Knight, Ltd.	lxx
Duche, T. M., & Sons (U.K.), Ltd.	cxii
Durazone Co., Ltd.	lxxxii
Durex Abrasives, Ltd.	lv
Edme, Ltd.	
Edwards, F. J., Ltd.	
Ellison, George, Ltd.	
English Grains, Ltd.	
Erwoods, Ltd.	
Eva, Alfred, & Sons, Ltd.	
Evans, Norman, & Rais, Ltd.	
Evans, Wm., & Co., Ltd.	
Evershed & Vignoles, Ltd.	
Evolite Plastics, Ltd.	
Feculose Co.	
Fenner, J. H.	
Fisher & Ludlow, Ltd.	
Flexile Metal Co., Ltd.	
Food Installations, Ltd.	
Fraser, J., & Sons, Ltd.	
Frischmann, H.	
Fuller, Horsey, Sons, & Cassell, Ltd.	
Futurist Soft Furnishing Co., Ltd.	
Gardner, John, & Son	
Gardner, W., & Sons (Glos.), Ltd.	
G.E.C.	
Gee Mnfg. Co., Ltd.	
Glazebrooks, Ltd.	
Glossop & Bulay, W., Ltd.	
Glover, J., & Sons, Ltd.	
Gloy & Empire Adhesives, Ltd.	
Glynn Co., Ltd., The	
Goodyear Pliofilm	
Gosheron, John, & Co., Ltd.	
Gresham & Craven, Ltd.	
Grew, James, & Co., Ltd.	
Hall, J. & E., Ltd.	
Hall & Lane, Ltd.	
Halls, W. C., & Co., Ltd.	
Hamburger, M., & Sons	
Harrison, T., & Co.	
Hendry, James, Ltd.	
Hilton, Wallace & Co., Ltd.	
Hodgkinson, James (Salford), Ltd.	
Hodgson, Richard, & Sons, Ltd.	
Holdan, A., & Sons, Ltd.	
Holden & Brooke, Ltd.	
Horton Mnfg. Co., Ltd.	
Howards & Sons, Ltd.	
Hunt Partners, Ltd.	
Imperial Chemical Industries, Ltd.	xxxii
Industrial Tapes, Ltd.	
Jackson, J. G., & Crockatt, Ltd.	



The **KESTNER LABORATORY EVAPORATOR** has all the unique features of the full-size Kestner Patent Multi-Circulation Evaporator. It may be used as a single, double or triple circulating unit, making it particularly suitable for experimental work. Write for Leaflet 259.

KESTNER

Laboratory and Pilot Plant

EQUIPMENT

Indispensable for the Food Chemist

The **KESTNER LABORATORY STIRRER** is a remarkably efficient apparatus indispensable to every laboratory for stirring, mixing and agitation, operated from electric light supply, direct drive without gears, with variable speed control, silent in operation and enclosed type non-metallic switch. Suitable for attaching to standard laboratory retort stand and clamp, or independent support. Write for Leaflet 233b.

The **KESTNER LABORATORY SPRAY DRIER** produces a dry powdered product of uniform texture in one operation from solutions or suspensions. Easily cleaned and suitable for handling a wide range of products. Complete with heater, fan, dust collector, driving motor, and all necessary equipment. Write for Spray Drier Leaflet 264.

We also have available a comprehensive range of laboratory size film driers, fractionating stills, vacuum ovens, Infra Red apparatus ideally suited to pilot plant, investigation and for educational purposes.

KESTNER'S

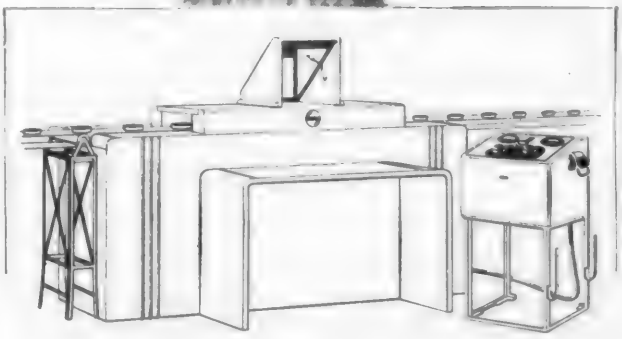
Chemical Engineers

5 GROSVENOR GARDENS, LONDON, S.W.1

Only ostriches enjoy paper clips

OSTRICHES are reputed to enjoy practically *anything* — from tin-cans to tent-pegs, from pen-nibs to paper clips. Human beings, however, are not so tough. That is why you cannot be too careful to ensure that your products are free from foreign inclusions of any kind. A single impurity can play havoc with your reputation.

The wisest policy is to use visual X-ray examination during manufacture. The "Macro 100", a specialised apparatus of outstanding performance, developed and manufactured by Philips, is ideal for this purpose. It is simple to operate, completely safe, constructed to stand up to the constant wear and tear of factory routine, and like all Philips products, it is absolutely dependable.



We shall be pleased to supply further details, or particulars to suit your own special requirements, on request.

PHILIPS ELECTRICAL
LIMITED

INDUSTRIAL X-RAY DEPT., CENTURY HOUSE, SHAFTESBURY AVENUE, LONDON, W.C.2
XR348

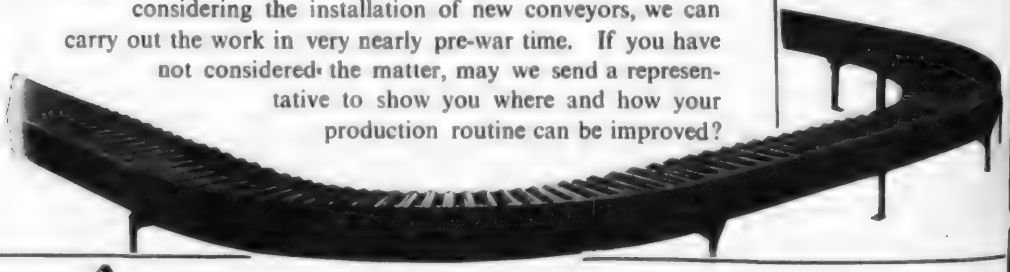
Index to ADVERTISERS

	Page
Jackstone Froster, Ltd.	lxxiv
Jenkins, Robert, & Co., Ltd.	lvi
Jenner, A. & C., Ltd.	vi
Jobling, James A., & Co., Ltd.	lxxxv
Johns, Sons, & Watts, Ltd.	cxiii
Johnson, A., & Co., Ltd.	
Johnson, S. H., & Co., Ltd.	l
Jones, Samuel, & Co., Ltd.	cvii, cviii
Kellie, Robert, & Son, Ltd.	xxxiv
Kestner's	iv
Kimpton Bros., Ltd.	xv
King, Geo. W.	xl, lx
Lambert, L., & Co., Ltd.	ci
Lewis, H. K., & Co., Ltd.	
Liebmann, K. J.	cx
Lime-Free Water & General Services, Ltd.	cx
London & Lancashire Insurance Co., Ltd.	lxxxiv
Lusty, W., & Sons, Ltd.	
Machinery (Continental), Ltd.	lxxxvi
Manesty Machines, Ltd.	xl
Marconi Instruments, Ltd.	xcv
Medway Corrugated Paper Co., Ltd.	xxi
Megator Pumps, Ltd.	
Metafiltration Co., Ltd.	
Metal Box Co., Ltd.	
Metal Closures, Ltd.	xxii
Metal Propellers, Ltd.	lx
Midland Bank Ltd.	
Ministry of Fuel & Power	xvi
Miracle Mills, Ltd.	
Mitchell, L. A., Ltd.	cxiv
Mono Containers, Ltd.	Cover i
Mono Pumps, Ltd.	
Monsanto Chemicals, Ltd.	
Montague Sharpe & Co., Ltd.	xcix
Morgan Crucible Co., Ltd.	xxxi
Morrisons Engineering, Ltd.	
Morton Machine Co., Ltd.	xxxii
Morton, Robert, & Co., Ltd.	civ
Musgrave & Co., Ltd.	
National Adhesives, Ltd.	
National Corrugated Paper Co Ltd.	
N.E.C.T.A., Ltd.	lxxxiii
Negretti & Zambra, Ltd.	cvii
Newalls Insulation Co., Ltd.	xvii
Newman Industries, Ltd.	xix
Newton, Chambers & Co., Ltd. (Lithcote)	li
Ormerod Engineers, Ltd.	
Osram Lamps	xii
Oury, Millar & Co., Ltd.	
Paillard & Benoit	cx
Pascall Engg. Co., Ltd.	lxxxvi
Pattinson, John, & Son, Ltd.	xcii
Paul, W. H., Ltd.	xliv
Pearlite Box Co., Ltd.	
Peerless & Ericsson, Ltd.	xlviii
Peerless Food Products	
Philips Electrical, Ltd.	v
Pneumatic Scale Corporation, Ltd.	
Polak & Schwarz, Ltd.	
Poppe Rubber & Tyre Co., Ltd.	xli
Popper & Co., Ltd.	
Porteus, G., & Sons, Ltd.	xlvi
Premier Colloid Mills, Ltd.	ci
Premier Filterpress Co., Ltd.	xciv
Prodorite, Ltd.	ciii
Pulsometer Engg. Co., Ltd.	cxiv
Purdy Patent Machinery Co., Ltd.	cv
P.X., Ltd.	cviii
Quickfit & Quartz, Ltd.	lxix
Ransomes, Sims & Jefferies, Ltd.	
Ratsouris, Ltd.	cv
Rayner & Co., Ltd.	
Reads, Ltd.	xxviii
Remington Rand, Ltd.	
Rhodes, Geo., & Son, Ltd.	cviii
Riddell, W., Cousland & Co., Ltd.	xc
Roneo, Ltd.	
Roneo-Neopost, Ltd.	lxiv
Rozalex, Ltd.	
Sangamo Weston, Ltd.	lxxiii
Saunders Valve Co., Ltd.	
Schori Metallising Process, Ltd.	
Scott, George, & Son (London), Ltd.	
Shaw Publishing Co., Ltd.	lxxxi
Sheldons, Ltd.	lxxxviii
Shell Chemicals, Ltd.	lxi
Short & Mason, Ltd.	
Silverson Machines (Sales), Ltd.	lxxxviii
Simon, Henry, Ltd.	xlv
Small Electric Motors, Ltd.	civ
SMALL ADVERTISEMENTS	
Smith, T., & Co.	
South Wales Condenseries, Ltd.	
Spirax Mnfg. Co.	
Spooner Dryer & Engg. Co., The	
Standard Synthetics, Ltd.	
Steels Engg. Products, Ltd.	
Steel, John	
Steel & General, Ltd.	
Sternol, Ltd.	
Stevenson & Howell, Ltd.	
Sturge, J. & E., Ltd.	
Summerson, Thos., & Sons, Ltd.	
Sumo Pumps, Ltd.	
Sunmill Food Products, Ltd.	
Sutcliffe, J. W., & Co.	
S. W. & W. E. Standard Mnfg. Co., Ltd.	
Swallow Engg. Co., Ltd.	
Talbot Stead Tube Co., Ltd.	
Tan-Sad Chair Co. (1931), Ltd., The	
Taylor Rustless Fittings Co., Ltd.	
Tecalemit, Ltd.	
Thomas, Richard, & Baldwins, Ltd.	Cover
Thomas, W. K., & Co.	
Thomas & Bishop, Ltd.	
Thompson Bros. (Bilston), Ltd.	
Thompson & Norris Mnfg. Co., Ltd.	
Thomson, L., Ltd.	
Trapinex, Ltd.	
Tyne Truck & Trolley Co., Ltd.	
United Glass Bottle Mnfrs., Ltd.	
United Indigo Co., Ltd.	
Vokes, Ltd.	
Walker, Crosweller & Co., Ltd.	
Walworth, Ltd.	
Warwick Production, Ltd.	
Warne, Wm., & Co., Ltd.	
Watford Chemical Co., Ltd.	
Webster, Isaac, & Sons, Ltd.	
Weir, G. & J., Ltd.	
Whiffen & Sons, Ltd.	
White, Tomkins & Courage, Ltd.	
Whittaker, Arthur	
Wiggin, Henry, & Co., Ltd.	
Willcox, W. H., & Co., Ltd.	
Williams (Hounslow), Ltd.	
Winget, Ltd.	
Wood, D. S. (Chemicals), Ltd.	
York Shipley, Ltd.	

"COMING SIR !"

THE food trades depend upon people like yourself for their supplies ; and you depend upon people like us for your equipment. As it happens, we can help with your production problems *now*, because our own delivery is particularly good. If you have been considering the installation of new conveyors, we can carry out the work in very nearly pre-war time. If you have not considered the matter, may we send a representative to show you where and how your production routine can be improved?

One of the many types of Jenner Conveyor now in use in the Food Industry.



Let Jenners Handle It

Specialists in Handling Equipment for every type of Light Industry.

A. & C. JENNER, LTD., CLARENDON WORKS, MITCHAM, SURREY MITCHAM 4044

Whether you are a £100 or a £1,000,000 Company . . .

this page could change your business

Lack of familiarity with CALFOS Powder can mean that your organisation is not quite abreast of the times—like the liner in the picture. So spare a moment to see how CALFOS POWDER can help to increase your turnover. Then drop us a line for more detailed information and a free test sample.

Enquire about

CALFOS

Powder

CALFOS LTD., Imperial House, Kingsway, London, W.C.2

This is HOW CALFOS helps

It is a proved fortifier—valuable as a nutritive supplement in baby foods, cereal products and invalid tonics.

Snow white, it can represent an economy on milk powder. It can be used both as a whipping agent and as an aeration powder.

This is WHY it helps

CALFOS POWDER is a sterilised concentrate. Consisting mainly of calcium and phosphorus (in natural proportions), it is processed without the use of chemicals. It offers absolute purity, sterility and consistency of formula.

CALFOS POWDER is approved by the Ministry of Food.

Enquire now for further particulars of this unique substance. Enquiries from small progressive firms are as welcome as those from the larger houses.

P.2.

30"x 18" WATER DRIVEN CENTRIFUGALS COMPLETE WITH MIXER, ETC.

30" MOTOR DRIVEN INCLINED SPINDLE SEMI-CONTINUOUS CENTRIFUGAL

● SPECIALISTS IN CENTRIFUGALS FOR FOOD PROCESSING

BROADBENT
HIGH SPEED
CENTRIFUGALS

. . . . . *for the*

EFFICIENT –

• **SEPARATIN**

• **FILTERIN**

• **DRYIN**

. . . . . *of*

FOOD PRODUCT

Clean and easy to handle —Broadbent Centrifugals have established a world-wide reputation for efficient, trouble-free running at high speeds.

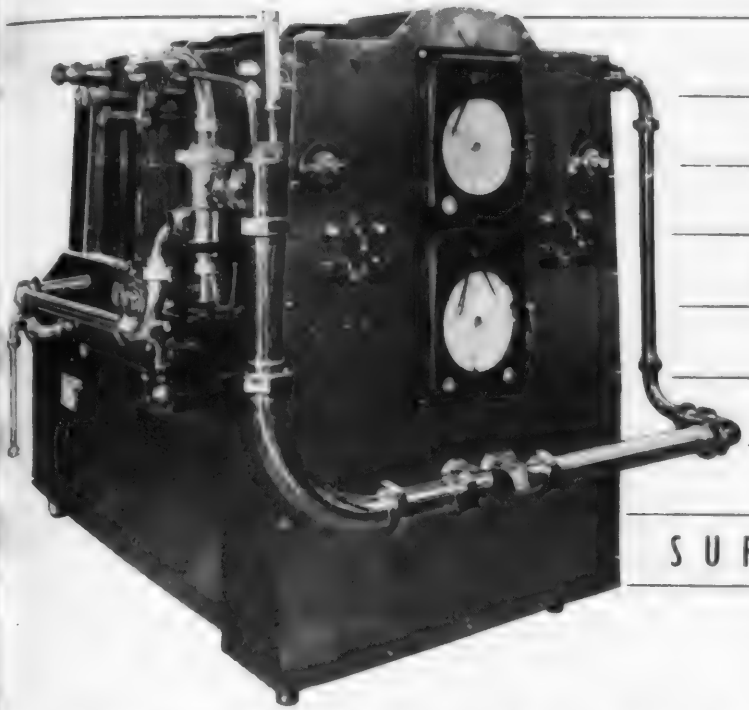
Direct electrically-driven, motor-driven or belt-driven, these Centrifugals are manufactured in a large range of sizes to suit a variety of purposes.

THOMAS BROADBENT & SONS LTD
HUDDERSFIELD

Tel: 5520 (6 lines) HUDDERSFIELD

Grams: BROADB HUDDERSF

'The Talk of The Show!'



COMPACT

COMPLETE

CLEAN

SUPERB DESIGN

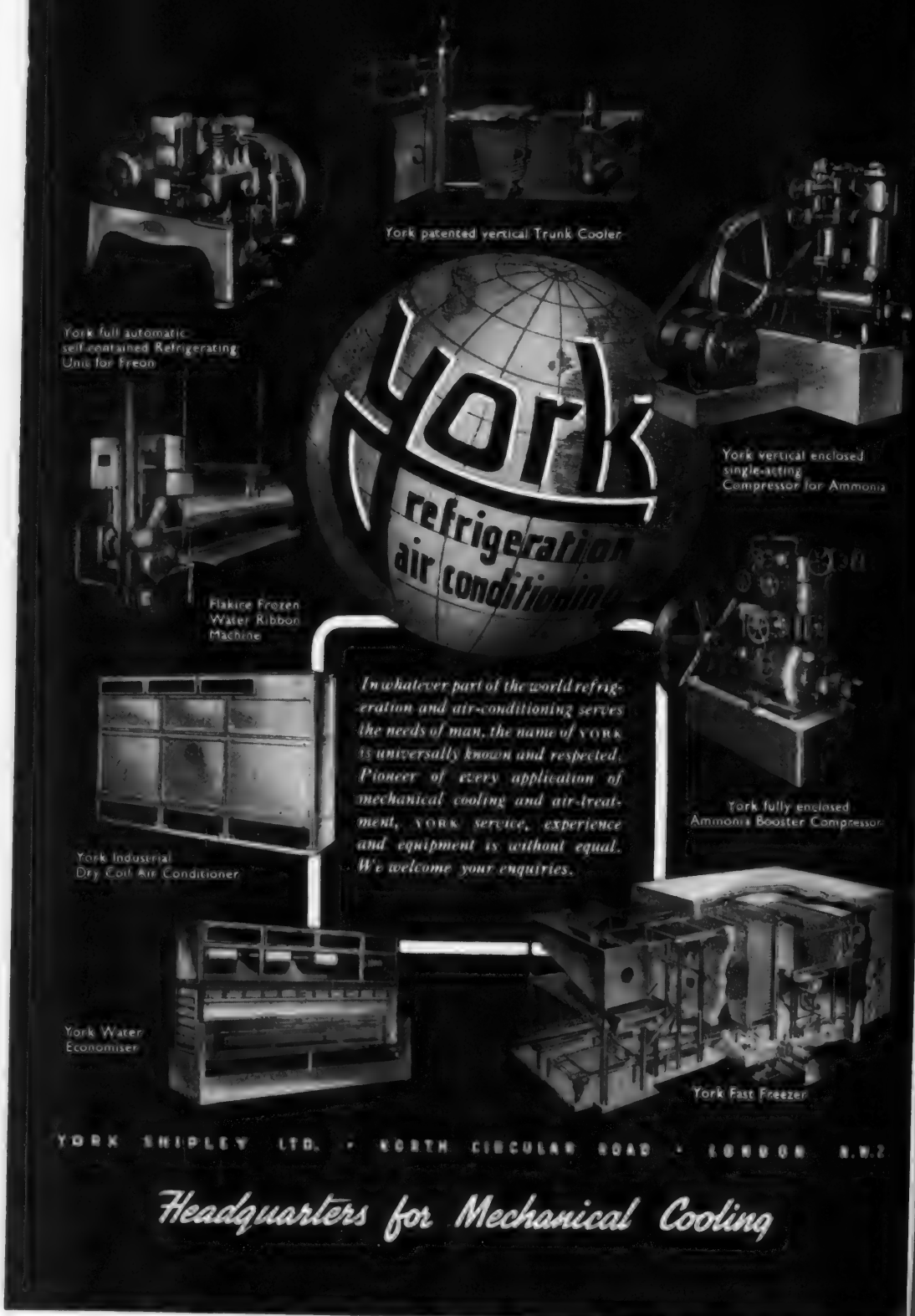
THE *NEW* 'FULL-FLO MERCURY' H.T.S.T. PASTEURISER

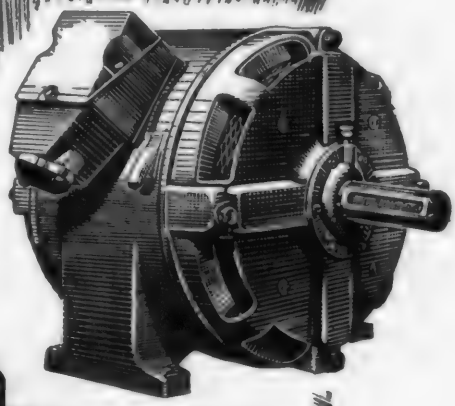
The many advantages of this new C.P. machine were the subject of much enthusiastic comment when it was first exhibited at the recent Dairy Show. It presents in one compact plant a Heating and Circulating Unit, Air Compressor, Air Storage Tank, Milk Balance Tank and all the equipment necessary for milk processing, including the most modern devices and sanitary arrangements.

Write for full details to

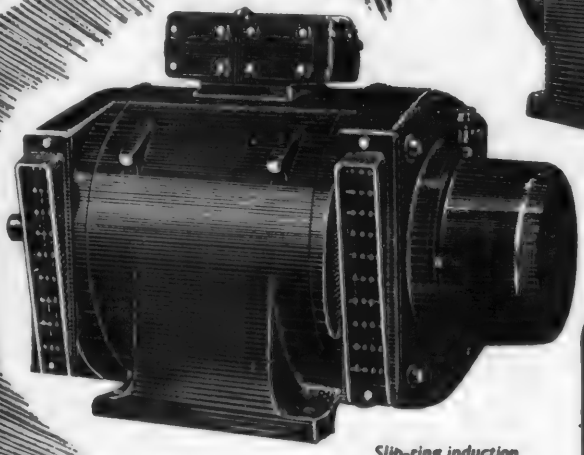
THE CREAMERY PACKAGE MFG. COMPANY LTD.

Avery House · Clerkenwell Green · London · E.C.1. *Clerkenwell* 4997/8

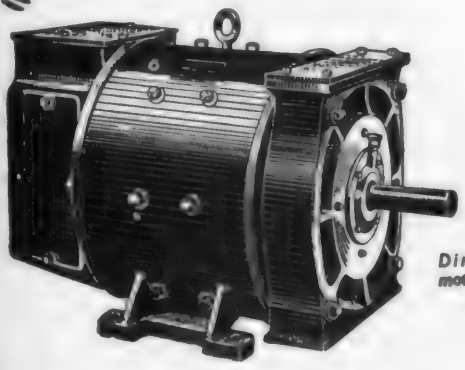

York patented vertical Trunk Cooler
York full automatic self-contained Refrigerating Unit for Freon
York vertical enclosed single-acting Compressor for Ammonia
York refrigeration air conditioning
Flakice Frozen Water Ribbon Machine
In whatever part of the world refrigeration and air-conditioning serves the needs of man, the name of YORK is universally known and respected. Pioneer of every application of mechanical cooling and air-treatment, YORK service, experience and equipment is without equal. We welcome your enquiries.
York fully enclosed Ammonia Booster Compressor
York Industrial Dry Coil Air Conditioner
York Water Economiser
York Fast Freezer
YORK SHIPLEY LTD. • NORTH CIRCULAR ROAD • LONDON N.W.2
Headquarters for Mechanical Cooling



Squirrel-cage induction motor, protected type.



Slip-ring induction motor, drip-proof type.



Direct current motor, pipe ventilated type.

Standard G.E.C. Motors cover all normal drives—A.C. or D.C.—constant or variable speed, any form of enclosure—and each motor complies with British Standard No. 168.

MOTORS *by* G.E.C.

Advt. of The General Electric Co. Ltd., Magnet House, Kingsway, London, W.C.2

HERE'S GOOD LIGHTING IN A TYPICAL FACTORY BAY . . .

It is available now for all industries

Compared with Tungsten Lamps of similar wattage, OSRAM Fluorescent lamps save greatly on electricity. Besides, they show a marked improvement in seeing conditions, which results in increased production and more accurate workmanship. Glare is reduced and there are no harsh shadows. An extensive range of G.E.C. Fluorescent fittings is available.

Osram

FLUORESCENT LIGHTING and *G.E.C.* Fittings

★ G.E.C. ILLUMINATING ENGINEERS WILL ADVISE AND ASSIST

THE GENERAL ELECTRIC CO. LTD. MAGNET HOUSE, KINGSWAY, LONDON, W.C.2

THE preservation of fish, fruit and vegetables in containers, treated with acid and sulphur-resisting lacquers by ARTHUR HOLDEN & SONS LTD. is no fairy tale.

Their famous trio—"Super Zinnatine" for fruits; "Super Sulfatine" for vegetables and meats; and "Zinnatine Marina" for fish positively guarantee perfect preservation of the natural colour and flavour of the original product. These lacquers give security in every can—and that's the security that makes the best propaganda for your product.

C·R·S NEED 5 EXTRA EMPTY CONTAINERS!

If every trader on whom the C.R.S vans call made a special effort to add five more empty containers to his stack, the weekly collection would get very near the **million and a half mark,** which is what we need to keep pace with trade requirements and national economy demands.

✳ *The score to date*

Here are some facts that should encourage you in this now great national task. To date C.R.S have collected over 300,000,000 empty containers, thus saving the nation many hundred thousand tons of coal, wood-pulp, timber and other vital raw materials, and effecting a conservation of labour, shipping space and — above all — dollars.

Container Recovery Service

S.P.D Limited, Unilever House, Blackfriars, London, E.C.4

CRS 55-940-80

IMPORTANT ANNOUNCEMENT

To all users of GUM TRAGACANTH

YOUR INDIVIDUAL REQUIREMENTS ARE PROVIDED FOR BY RED CARNATION BRAND POWDERED GUM TRAGACANTH, WHICH IS NOW AVAILABLE IN FOUR STANDARDISED GRADES, OF CERTIFIED QUALITY AND CHARACTERISTICS.

- GROUND by a special process to ensure controlled tenuity.
- VISCOSITY established under expert supervision.
- TESTED at every stage of processing.
- GRADED to a series of predetermined standards.
- PACKED in airtight tins.

GUM TRAGACANTH is an essential ingredient in many industrial and pharmaceutical formulæ. Being a natural product, with natural imperfections and variations, its commercial applications have, in the past, been attended by problems arising whenever the characteristics of an ingredient are not stable. Now—these problems have been solved by the marketing of RED CARNATION Brand Gum Tragacanth. Whenever you order RED CARNATION Brand Gum Tragacanth, and whatever Grade you order, you know what you will be receiving—Gum Tragacanth in a stabilised form as regards viscosity, colour and fineness of powder. In addition, you are certain that the Gum Tragacanth you receive is fresh, as the large turnover of RED CARNATION Brand obviates the risk of the Gum in stock deteriorating through long storage.

GRADES			
1	2	3	4
BXXX	BXX	BX	BA

● If you have any queries regarding RED CARNATION Brand Gum Tragacanth—*e.g.* which Grade is most suitable to your requirements—our Research Department will be pleased to advise you.

The literature dealing with Gum Tragacanth is not readily accessible to the average commercial user. On request, you can obtain a free, 12-pp. illustrated booklet, telling "The Story of Gum Tragacanth."

RED CARNATION BRAND

Powdered **Gum Tragacanth**

KIMPTON BROS. LTD.

Established 1882

DEPT. FM.1, 110 FENCHURCH STREET, LONDON, E.C.3. Tel.: ROYal 5544 (4 lines)

These girls shivered in their shoes, but . . .

the gardener's crops grew hot and strong!

The frost never caught old Giles' superb runner beans outside the main workshop windows, but the feet and fingers of the girls working *inside* got well and truly nipped ! So the welfare-minded management sent for the Ministry's Regional Fuel Engineer.

When he arrived, he found that the main supplying steam to heat the building was lagged on all *exposed* surfaces, but ran quite bare for 200 yards beneath old Giles' vegetable plot ! No wonder the crops flourished and the girls shivered !

To-day the pipe is lagged for its whole length, the girls are warm and happy, output is soaring and gardener Giles is wondering how he can get soil-heating for his precious crops !

This case was perhaps typical of many wasteful practices that are still costing the nation thousands of tons of coal a year. All too often 'out of sight' means 'out of mind', and the leak of hard won fuel continues year after year, unchallenged and unchecked.

You are a go-ahead type, of course, so your Fuel Efficiency is naturally of a high standard—but could there be *anything* you've overlooked ? There's one way of making sure—ask the Ministry's Regional Fuel Engineer to visit you. His advice *may* be worth its weight in gold and his services are FREE.

YOUR REGIONAL FUEL OFFICE

REGION	ADDRESS	TELEPHONE
Northern	Government Buildings, Ponteland Road, Newcastle-on-Tyne, 5	Newcastle 28131
North-Eastern	Century House, South Parade, Leeds, 1	Leeds 30611
North-Eastern	Mount Pleasant School, Sharrow Lane, Sheffield	Sheffield 52461
North-Midland	Castle Gate House, Castle Gate, Nottingham	Nottingham 46215
Eastern	Shaftesbury Road, Brooklands Avenue, Cambridge	Cambridge 56269
London	Mill House, 87 89, Shaftesbury Avenue, W.1	Gerrard 9700
South-Eastern	Forest Road, Hawkenbury, Tunbridge Wells, Kent	Tun. Wells 2780
Southern	Whiteknights, Earley, Reading	Reading 61491
Wales	27, Newport Road, Cardiff	Cardiff 9234
South-Western	12 14, Apsley Road, Clifton, Bristol, 8	Bristol 30223
Midland	Temporary Office Buildings, Hagley Road West, Birmingham, 17	Bearwood 3071
North-Western	Burton Road, West Didsbury, Manchester, 20	Didsbury 5180-4
Scotland	145, St. Vincent Street, Glasgow, C.2	Glasgow City 7636
Scotland	51, Cockburn Street, Edinburgh, 1	Edinburgh 24881
Scotland	1, Overgate, Dundee	Dundee 2179

ISSUED BY THE MINISTRY OF FUEL AND POWER

This excellent example of low temperature insulation shows the skill of the Newalls craftsman in the application of cork finished with cement and painted. Newalls Insulation Co. Ltd., maintain staffs of skilled workmen at their various depots throughout the country and are, therefore, equipped to undertake the application as well as the supply of their Nonpareil cork insulation.

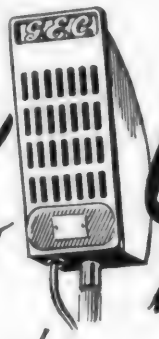
NEWALLS
Insulation Co. Ltd.
(A MEMBER OF THE TURNER & NEWALL ORGANISATION)

Heat, Cold and Sound Insulation Specialists

HEAD OFFICE: WASHINGTON CO. DURHAM OFFICES AND DEPOTS AT LONDON, GLASGOW, MANCHESTER, NEWCASTLE, BIRMINGHAM, BELFAST, BRISTOL AND CARDIFF

MODERN FACTORY

Sound Systems



by G.E.C.

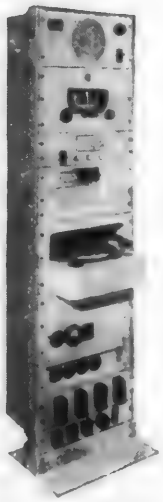
The G.E.C. sound system will provide your factory with a complete and comprehensive sound service.

Facilities are provided for staff control, location of individuals, automatic time signals, fire alarms, and " Music while you work," either by record playing or radio programmes.

Before installing any equipment, your factory will be " measured for sound " by G.E.C. specialists, who will ensure that the equipment installed is best suited to the acoustic requirements of your buildings.

No modern factory is complete without a sound system. It can be used to great advantage in improving works relations, giving instructional talks and in putting over your own personal messages.

A quotation will gladly be given upon request.



FIRE ALARMS

TIME SIGNALS

LOCATION OF INDIVIDUALS

STAFF CONTROL

MUSIC WHILE YOU WORK

The General Elcctric Co Ltd, Magnet House, Kingsway, London W.C.

Soaring production wins big savings

Newman reduces prices

OF FRACTIONAL & INDUSTRIAL MOTORS & STARTERS

NEWMAN INDUSTRIES LIMITED, YATE, BRISTOL. London Office: 32, Victoria St., S.W.1

WILLCOX

VEE ROPE DRIVES

DESIGNED TO MEET TODAY'S NEED

Smooth and positive running without slip or stretch.

Easily installed and no maintenance needed.

Single Ropes transmit from ¼ to 23 horsepower according to size and speed.

Grooved Pulleys also supplied for drive conversions.

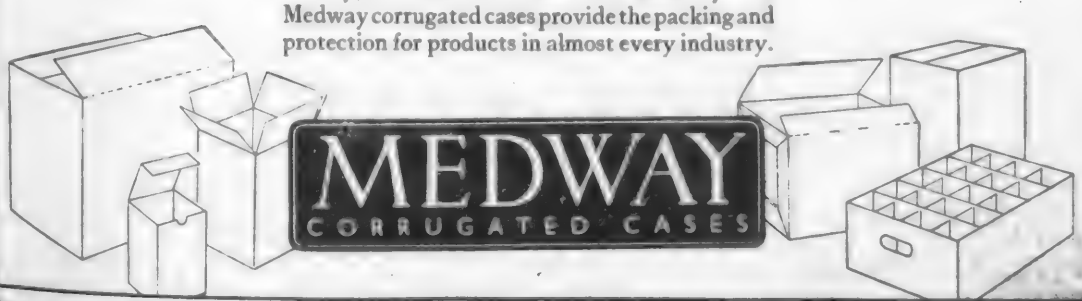
Write now for Prices and Technical Data

W. H. WILLCOX & CO. LTD.
SOUTHWARK HOUSE, LONDON, S.E.1
HOP 3771 (13 lines)

They Came to the Medway

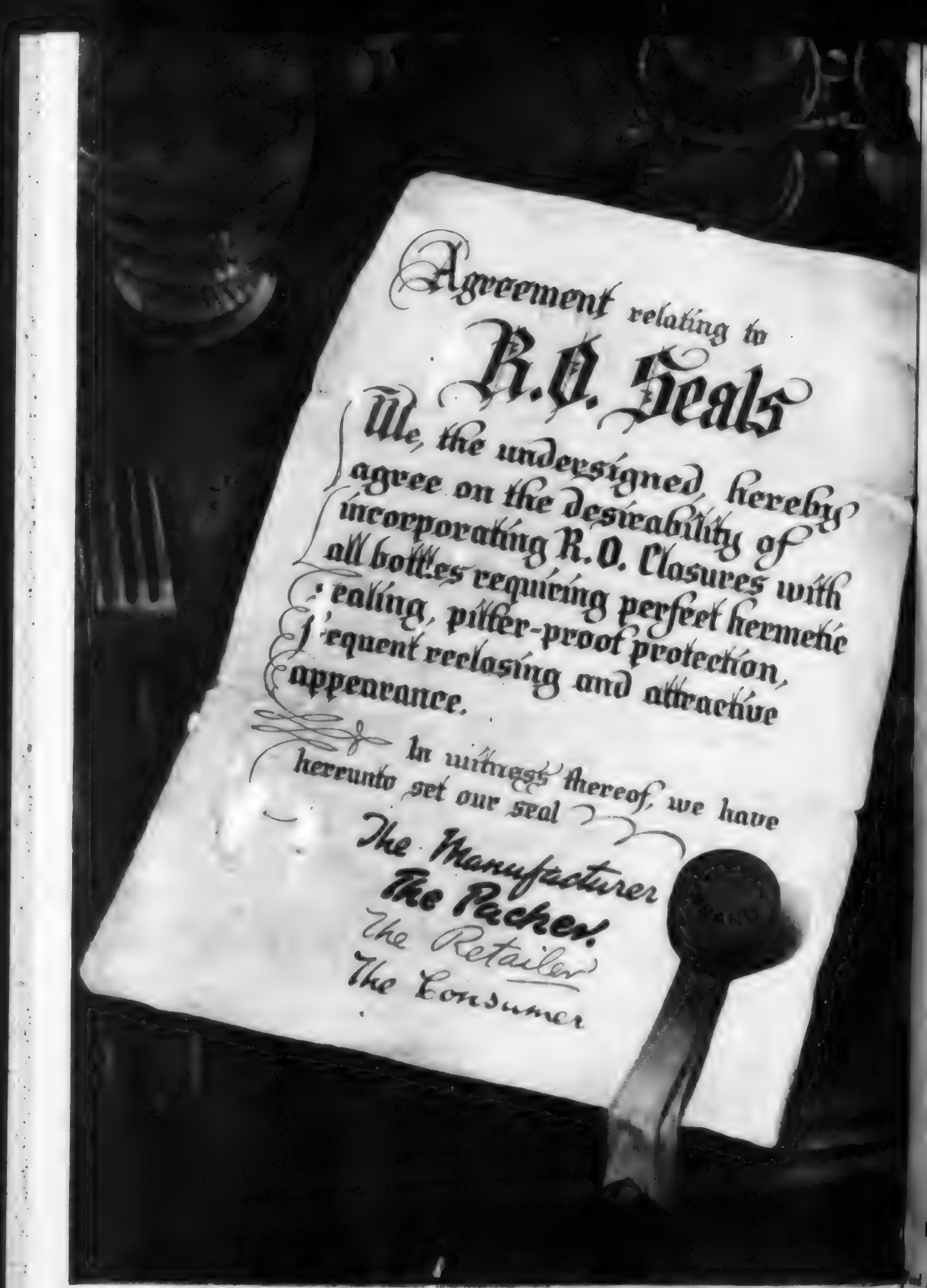
CHARLES DICKENS. The association of Dickens with Kent lasted throughout his life. In 1855 he purchased Gad's Hill Place, near Rochester, and it was the pride of his life to entertain friends and show them the neighbouring country. Referring to a visit from Longfellow, Dickens wrote "I turned out a couple of postilions in the old red jackets of the old red royal Dover road for our ride, and it was like a holiday ride in England fifty years ago".

To-day, manufacturers come to the Medway. For Medway corrugated cases provide the packing and protection for products in almost every industry.



THE MEDWAY CORRUGATED PAPER CO. LTD., NEW HYTHE, Nr. MAIDSTONE, KENT

London Sales Office: Blackfriars House, New Bridge Street, London, E.C.4


Agreement relating to
R.O. Seals
We, the undersigned, hereby agree on the desirability of incorporating R.O. Closures with all bottles requiring perfect hermetic sealing, pilfer-proof protection, frequent reclosing and attractive appearance.
In witness thereof, we have hereunto set our seal
The Manufacturer
The Packer.
The Retailer
The Consumer

AN ANNOUNCEMENT OF META CLOSURES LTD., WEST BROMWICH, STAFFORDSHI

'EDICOL' COLOURS

'EDICOL' COLOURS are now being produced in a more concentrated form possessing a higher degree of solubility. The high standard of purity laid down for the 'Edicol' Colours has been fully maintained.

IMPERIAL CHEMICAL INDUSTRIES LIMITED · LONDON, S.W.1

D.91

A Judge of FLAVOURS!

ESSENCES *Flavourings* ESSENTIAL OILS

IT'S FLAVOUR THAT COUNTS BECAUSE YOUR CUSTOMERS JUDGE YOUR GOODS ON THEIR PALATE-APPEAL, & BUY—& BUY AGAIN—THE GOODS THEY LIKE.

FOR DELICIOUS FLAVOURS USE "RED CLUB" BRAND PRODUCTS MADE SPECIALLY FOR THE FOOD TRADE. THEY'RE REALLY GOOD!

SOLE MAKERS

B&F Barnett Foster Ltd.

ESTABLISHED IN THE YEAR 1858

RED CLUB BRAND PRODUCTS

NIAGARA WORKS, LONDON, N.1. Phone. Clissold 7132

A

NEW

Hodgkinso

Coking

Stoker

The "Low Ram"

LOW RAM

It's in your own hands—the choice of the pectin that *never* varies. For years increasing numbers of jam manufacturers have avoided setting troubles by using "Elpex" apple pectin and holders of M. of F. permits are invited to send for testing samples. Remember—every batch of "Elpex" is tested for jel making strength. That is why it is so consistently dependable.

WM. EVANS & CO. (Hereford & Devon) **LTD.**
20 WIDEMARSH, HEREFORD. Est. 1850

If you are thinking of advertising or looking for an advertising agent

— it may pay you to read this.

Advertising agencies vary. Some are great organisations with large boards of Directors and with turnovers running into millions. They can show you under one "roof" not only the essential departments of an advertising agency, but also separate organisations for Market Research, for making Advertising Films, and for doing all sorts of Art work. They may even show you complete block-making and printing plants.

Others are more or less one-man concerns, dependent largely on the brain and experience of one principal.

In between comes the medium-sized agency with a team of half a dozen or so principals, backed by a hand-picked staff.

We are in this category, and for many advertisers it is the ideal choice. With such an agency the directors can take a personal interest in every account and can render to each client a really personal service, which might be impossible for one of the great organisations. On the other hand the principals, between them, have a range of experience which would be beyond the reach of any one individual.

In order to render this personal service, we, like a wise cobbler, stick to our last. We regard certain things as essentially part of an Advertising Agent's Service, which we can do better than anyone else, while certain other things like market research and running a printing works are better left to specialist firms, under our supervision and guidance.

Thus we keep our minds free for our real function and are not harassed by the responsibility of other businesses, which are at best only on the fringe of our job.

Moreover, by adhering to such principles and by concentrating our energies and abilities on the real business of advertising, we escape heavy overheads. We never have to be obsessed with how much or how little a client is going to spend., We can devote time to the small firm, which wants to grow, just as we do to the big one seeking to increase an already achieved success.

Before you decide, would it not be worth asking us to talk things over with you? In any event send for our little booklet "Things Advertising Cannot Do." You will find it repays the reading. This coupon, pinned to your letter-heading, will bring it by return.

Erwoods Ltd.

International Advertising Agents since 1895.

211, PICCADILLY, LONDON, W.1.

Phone: Regent 7464

Erwoods Ltd.,
211, Piccadilly, London, W.1.

Please send your booklet to
Mr.

He does not want you to call for the moment

3 point introduction to the RINGSEAL NECK

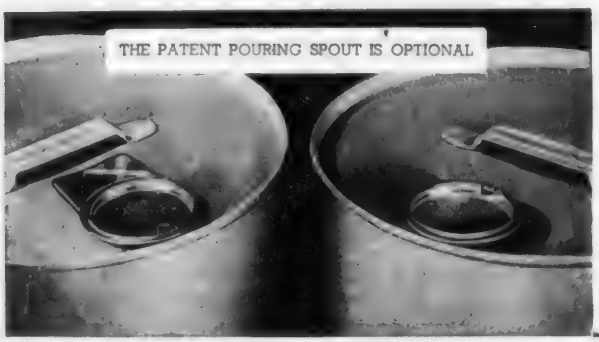
1 The Ringseal pilfer-proof band, the presence of which unbroken is a guarantee that the contents are intact. Once broken, the Ringseal cannot be replaced.

2 The patent rotatable pouring spout with pre-formed sides, which is turned inside the chimb of the drum during manufacture, transit or storage, to protect it from damage.

3 The Ringseal neck itself consisting of a seamless drawn stamping, which has a greater degree of rigidity, gauge for gauge, than other fittings.

Ringseal pilfer-proof neck fittings are suitable for the majority of standard drums, and they can be capped and sealed in one operation. They do not increase the physical dimensions of the containers and do not absorb ullage. Rubber or other liners can be incorporated for hermetic packing.

Ringseal necks will shortly be available in several sizes, and manufacturers and packers are invited to investigate now the application of Ringseal necks to their own products. Ringseal necks are covered under British Patent Application Nos. 19549/47, 26673/47, 13730/48 and 461/4[illegible] and patent applications have also been made in most countries in the world.



RINGSEAL
pilfer-proof
closures

NEX LIMITED, Orrell House, Orrell Lane, W[illegible]
Liverpool, 9. Aintree 3600; and
227 Grand Buildings, Trafalgar Square, Lon[illegible]
W.C.2. WHI 5781. Also at Glasgow, Belfast & C[illegible]

SPIRAX CORNER

THERE ARE smooth stagnant films of air and water on *all* condensing surfaces in steam-heated plant. They put up a prodigious resistance to heat transfer from the steam. *If left alone they will frustrate any and every effort you can make to get better heating and better output.*

You will find an immediate improvement if you can make the films *thinner* and weaken their resistance. *This is done very effectively by improving the steam trapping and air venting installation. We will be glad to show you how.*

Where the cross-sectional area of the steam space isn't much greater than that of the steam supply pipe (on certain drying ovens, pipe heaters, and some kinds of jacketed pan, for instance) you can do even more. If you make the steam go round and round the steam space at a much faster speed you can increase still further the rate of heat transfer from the steam to the process. Thus, quicker heating and a higher rate of output.

This is done by the Spirax Steam Circulation System (patent applied for). The steam is sent round and round the steam space in such a way and at such a spanking rate that a radical change is brought about in the character of the stagnant films: their normal streamlined flow is changed to *turbulent* flow. *This turbulence at the condensing surfaces reduces considerably the heat-resisting effect of the films and can make a world of difference to heating efficiency and plant output.*

We will be glad to tell you more if you will please send in the enquiry slip.

"The steam goes round and round like this, Liz – and very fast

SPIRAX MANUFACTURING CO. LTD., CHELTENHAM, Glos.

Phone: Cheltenham 5175. *Grams: Spirax, Cheltenham.* LONDON OFFICE: 28 VICTORIA STREET, S.W.1

SPIRAX SAVE STEAM

SPIRAX STEAM TRAPPING AND AIR VENTING

To SPIRAX MANUFACTURING CO. LTD., CHELTENHAM, Glos.

Please send details of your STEAM CIRCULATION SYSTEM *combined with correct steam trapping and air venting methods.*

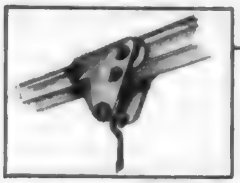
NAME:

ADDRESS:

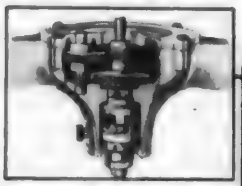
A1248

Save LABOUR, TIME & MONEY ON ALL YOUR SCREENING JOBS WITH *Bridges*

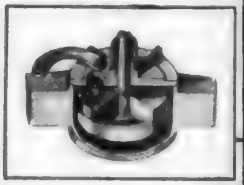
SIEVING & GRADING MACHINES



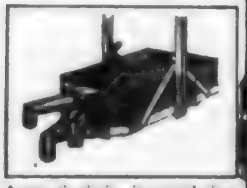
For easy movement across the factory, machine can be suspended from trolley running on an H joist.



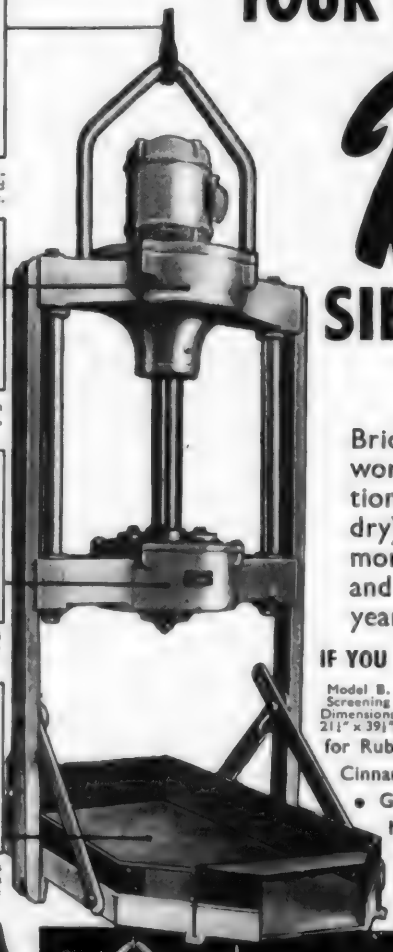
Transmission from motor to main shaft is through a gear train, running in an oil-bath.



Amount of vibration can be varied by simple adjustment of specially designed fly-wheel.



Automatic sieving in several sizes simultaneously, by arranging a number of trays one above the other, as shown.



Bridges Sieving and Grading Machines, working on the principle of direct vibration, screen all types of material (wet or dry) more satisfactorily, more quickly and more cheaply. Sturdily built, well balanced and well finished, they will give many years of trouble-free service.

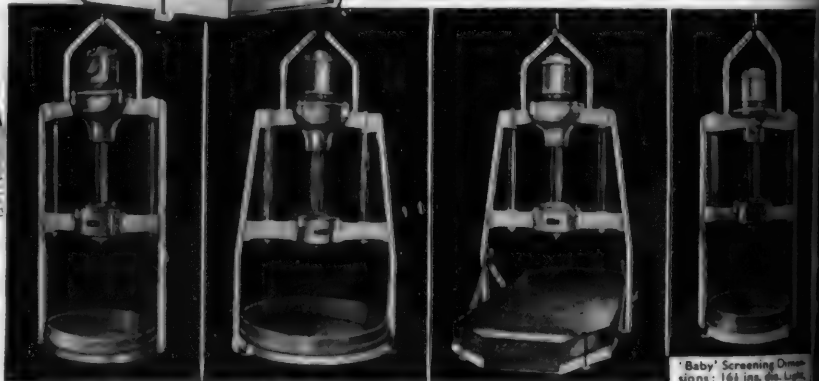
IF YOU REQUIRE TO SCREEN ANY OF THESE MATERIALS

Model B. Screening Dimensions 21¼" x 39½".

• Asphalt (granulated) • Barley • Cocoa • Custard Powders • Carbon • Chemicals—for Rubber and Paper Industries and Electrode Manufacture • Cinnamon • Colours (Liquid) • Face Powder • Gravel • Gun Powder • Lead Pellets • Lacquers • Meal • Milk Powder • Chalk • Coal • Flour • Paints • Sugar (granulated or ground) • Spices • Sweets • Soap • Sand • Semolina • Salt • Varnish, etc., etc., etc.

IF YOU NEED A BRIDGES SIEVING AND GRADING MACHINE

Write for attractive illustrated brochure in colour showing Bridges Sieving and Grading Machines in use, and giving full details of every machine, to address below.



Model A. Screening Dimensions: 21¼ ins. dia.

Model C. Screening Dimensions: 29½ ins. dia.

Model D. Screening Dimensions: 29½ ins. x 51 ins.

'Baby' Screening Dimensions: 16½ ins. dia. Light, handy machine for small factories, etc.

S. N. BRIDGES & CO., LTD.

PARSONS GREEN LANE, LONDON, S.W.6 • RENown 1177

CARBON BEARINGS

Morganite carbon bearings are unique in needing no lubrication of any kind : moreover, they withstand high temperatures and corrosive influences.

They are therefore expressly suitable for use in dough mixing machines, bakers' ovens, breakfast cereal conveyors, and bottle washing machines, where the complete absence of contamination by oil or grease is valuable. They can be used in many other applications, for they resist conditions that are harmful to other bearings, such as lack of lubricant, the presence of chemical liquids or fumes, steam and cyclic changes of temperature.

These bearings are also supplied, for certain applications, with the carbon bush inserted in a steel shell.

THE MORGAN CRUCIBLE COMPANY LTD,
LONDON, S.W.11

A
MORGAN
product

素頭

IN CHINA
MEANS
QUALITY

Long before the North and South Poles were discovered, the Chinese invented a magnetic compass to guide their ships. This is one of the many inventions given to mankind by the Chinese.

MORTON

MADE IN SCOTLAND

MORTON MACHINE CO. LTD.
WISHAW · SCOTLAND

Means Quality Everywhere

BAKERY EQUIPMENT

THE FINAL PULL RINGS THE BELL

TRAPINEX

WINDOW TRANSFERS IN BRILLIANT PAINT WITHOUT FILM OR EDGE

HERE's where the campaign fails or succeeds, at the shop window! In the next few minutes the customer could be asking for *your* product. Let 'Trapinex' Paint Transfers (Patd) provide that link with your publicity that will bring the customers into the shop. There is a special Fixing Service available throughout the U.K.

'Trapinex' Paint Transfers are produced in brilliant colours that are washable, durable, and do not unduly obscure the goods on display.

Horniman's Ltd, regular users of 'Trapinex' Paint Transfers in small designs for years, have now adopted them for large effective window pelmets as shown above. National advertisers in all sections of trade prefer 'Trapinex' Paint Transfers for their bold, unfailing effectiveness. Let us send you specimens and an 8-page brochure on the Story of 'Trapinex' Transfers showing their many vital uses in war and peace.

ADVICE freely given, but when you write for prices please state: (1) Size; (2) Quantity; (3) Number of colours; (4) Purpose; (5) Wording required; (6) A rough sketch would help. **We have No Stock Lines or Price Lists.**

TRAPINEX THE *Painted* WORD PREFABRICATED

Trapinex (Regd.) Paint Transfers are fully patented and manufactured only by

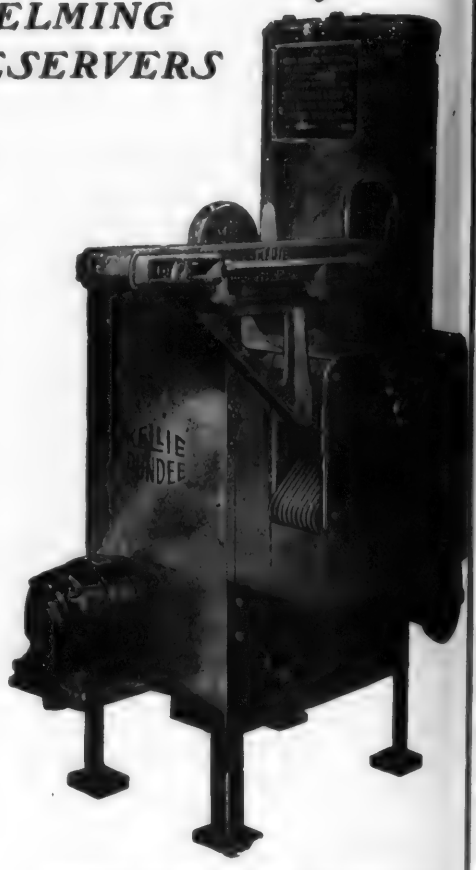
TRAPINEX LTD, 75 Commerce House, High Road, Wood Green, London N.22 (Opp. Town Hall)

Phone: Bowes Park 6811/3 *Grams: "TRAPINEX, Wood, London."* *Cables: "Trapinex," London*

4 in 1

CONSIDER THESE OVERWHELMING ADVANTAGES TO FOOD PRESERVERS

- **Oranges, Lemons, Tangerines, Grape Fruits, etc., from 1⅛″ to 3½″ diameter cut automatically into quarters, IRRESPECTIVE of shape. NO GRADING REQUIRED.**
- **The fruit is automatically pulped, and the peel is separated to any required thickness from 3/32″ to ¼″ ready for shredding.**
- **Thickness of peel instantly adjustable, micrometer accuracy being guaranteed; an absolutely clean peel, or one with a small proportion of pulp is obtainable at will.**
- **Peel, fruit pulp and juice are delivered separately at 12 lbs. per minute. The labour costs for this output SHOW A REDUCTION OF OVER 90% over handwork. This alone would enable the cost of the machine to be recovered in a few weeks.**
- **THE RISK OF SKIN DISEASE TO WORKERS is ABSOLUTELY ELIMINATED with this machine.**
- **All parts are of non-corrosive properties, a special acid-resisting alloy being introduced for this purpose. Arranged for direct coupled electric motor or belt drive with fast and loose pulleys.**



Delivery can be made for the forthcoming Marmalade Season

KELLIE'S

Improved Patent Automatic

Quartering, Peeling Separating & Pulping Machine

ROBERT KELLIE & SON, LTD.

Telephone: 2319 Dundee (3 lines) · **DUNDEE** · Telegrams: "Kellie, Dundee"

Manchester Representative: Mr. A. E. FIELDING,
Grosvenor Chambers, 16 Deansgate, Manchester. Telephone: Blackfriars 0449

This Machine cuts Labour Costs by over 90% and pays for itself in a few weeks

WARNES
Rubber Rings & Discs

QUALITY and ACCURACY
GUARANTEED
BY

WARNES

WILLIAM WARNE & CO. LTD., INDIA RUBBER MILLS, BARKING.
Telephone: Rippleway 3800 (ESTABLISHED 1837) Telegrams: "Warne Barking."

In all ages, the finest recompense for thorough workmanship put into the making of an article is the satisfaction given to the user.

TRADE MARK

GEORGE ELLISON
LIMITED
PERRY BARR BIRMINGHAM 22B

BULMER'S FIRMAJEL PECTIN..

GOES INTO THE FINEST JAMS

CONSISTENT QUALITY • PALE COLOUR • QUICK REGULAR SETTING POWER

Bulmer's offer tanker delivery to large users within reach of the bulk stores at Hereford, London and Manchester. Pectin piped to the boiling pan from factory storage tanks saves space, labour and handling costs.

Bulmer's Firmajel in cask is delivered by road service over a wide area of England.

Bulmer's Firmajel free from preservative supplied in tins containing 40 lbs. Convenient for small users and for makers of fresh fruit standard jams and jams for export.

H. P. BULMER & CO. LTD., HEREFORD · And at LONDON and MANCHESTER

Specially written for the Food Processor

FOOD PLANT SANITATION, Vol. I

By MILTON E. PARKER, S.B.,
Counselor in Food Production Development

Just published in America. 447 *pages.* 36*s.* 9*d. post free.*

DESIGNED for management personnel, industrial sanitarians, food technologists, etc., this volume outlines and discusses such pertinent phases of sanitary practice as come within the scope of the food processor. It includes pertinent information concerning safety in sanitary practice, emphasising legal responsibilities under the Federal Food, Drug and Cosmetic Act of 1938. The first source of organised information covering food plant sanitation in its broad aspects.

Contents: Role of Sanitary Practice in Quality Control. Sanitary Aspects of Buildings and Equipment. Sanitary Aspects of Water Supply. Waste Disposal and Utilisation. Establishment and Development of Sanitary Practices. Employee Training in Sanitary Practices. Maintaining Sanitary Practices. Salient Legal Aspects of Pest Control. Safe and Effective Insect Control. Safe and Effective Rodent Control. Fungicides. Germicides and Sanitisers. Effective Detergency. Effective Cleaning Practice and Operations. Sanitary Packaging Practice. Sanitary Aspects of Packaging Materials. Appendix. Excerpts from the Insecticide Act of 1910. The Food, Drug and Cosmetic Act of 1938 and Special Directives concerning Pertinent Food Ingredients, Contaminants, etc.

NEW THIRD EDITION

COMMERCIAL FRUIT AND VEGETABLE PRODUCTS

By W. V. CRUESS,
Professor of Food Technology and Chemist in the Experiment Station of the University of California.

Just published in America. 906 *pages.* 51*s.* 11*d. post free.*

THIS new edition of a standard text and reference book in food technology is the result of extensive revision to bring its material completely up to date. It includes the technological and scientific developments of the past eight years. New chapters have been added, together with a considerable amount of completely new material. One chapter discusses sanitation in food processing plants and also covers the basic principles and their applications in plant sanitation and waste disposal. Chapters on canning of fruits and vegetables, spoilage of canned foods, frozen-pack foods, packaging and dehydration have been extensively revised. There is also material on the mechanical handling and pre-treatment of fruits and vegetables. Nearly half the old illustrations have been replaced with new ones showing improved modern equipment in canneries, dehydrators and other food-processing plants. The reference list at the end of each chapter has been enlarged and modernised.

Contents: Micro-organisms in Relation to Fruit and Vegetable Products. General Principles and Methods. Brief History of Canning. Tin and Glass Containers. General Considerations in Establishing a Cannery. Washing, Blanching and Peeling Fruits and Vegetables. Grading Fruits and Vegetables for Canning. Syrups and Brines used in Canning. Exhaust and Vacuum. Processing of Canned Fruits and Vegetables. Canning of Fruits. Pickling and Canning of Olives. Canning of Vegetables. Spoiling of Canned Foods. Unfermented Fruit Beverages. Fruit and Vegetable Syrups and Concentrates. Pectin, Jellies and Marmalades. Fruit Jams, Butters, Preserves and Confections. Tomato Products. Sun Drying of Fruits. Dehydration of Fruits. Dehydration of Vegetables. Packing of Dried Fruits and Vegetables. Vinegar Manufacture. Pickles. Olive and Coconut Oils. Utilisation of Waste Fruits and Vegetables and Disposal of Wastes. Citrus By-products. Packing Cases and Other Packages. Wines. Frozen-pack Fruits and Vegetables. Vitamins. Plant Pigments and Related Compounds. Enzymes of Fruits and Vegetables. Plant Sanitation. Index.

The above two titles (and any others on technical, scientific and industrial subjects) may be obtained direct from:

THE BOOKS SALES DEPARTMENT

LEONARD HILL LIMITED, 17 Stratford Place, London, W.1

CONTAINERS by "GEEMANCO"

GEE MANUFACTURING Co. Ltd.

Phoenix Works, Fazakerley, Liverpool, 9. 'Phone: Aintree 1681-4
London Office: 66, Victoria Street, S.W.1. 'Phone: Victoria 1696

Multiply Manpower

AND MULTIPLY PROFIT BY

ELECTRICAR

INDUSTRIAL TRUCKS

Photograph on left is of an "Electricar" 1 ton model with fixed platform. Manpower skilfully and usefully applied is an important factor in the efficient production scheme. Old-fashioned transport methods within your factory mean not only waste of effort and lowered output, but lost money—your money. The inclusion of an "Electricar" Power Truck or fleet of trucks will save many man-hours and greatly speed up production. Upkeep and running costs are negligible. Full details and an illustrated booklet gladly sent on request.

GEO. W. KING LTD., E. C. B. WORKS, HITCHIN, HERTS

TELEPHONE: HITCHIN 960 (10 lines)

MANESTY

BRITISH MADE

TABLET MACHINES

Send for Complete Catalogue

GRANULATORS · MIXERS · COATING PANS
AUTOMATIC WATER STILLS

MANESTY No. 3 TABLET MACHINES for Tablets up 2¼" diam.

MANESTY MACHINES LTD.

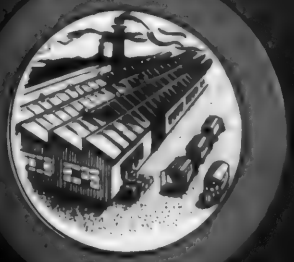
4a SPEKE HALL ROAD - LIVERPOOL, 1

Telephone: 'HUNTS CROSS 1321 Telegrams: "MANESTY LIVERPOOL"

POPPE

The Seal of Purity

TRADE MARK



RUBBER RINGS

GUARANTEED QUALITIES CONFORMING WITH THE SUGGESTED STANDARD OF THE FOOD AND DRUGS ACTS, for Phoenix, Automatic and Flat Caps, Sealing Compounds and Gummi Rings. Rubber Moulds for Fondants, etc.

Every description of Rubber goods for the Food Trade.

PROTECT THE HEALTH OF THE CHILDREN OF TO-DAY FOR THE FUTURE OF TOMORROW

THE POPPE RUBBER & TYRE Co LTD

TWICKENHAM MIDDLESEX

TEL. POPESGROVE 2271 GRAMS. POPPE TWICKENHAM

See your product in process without the danger of broken glass

"Perspex" Tubes and Cylinders

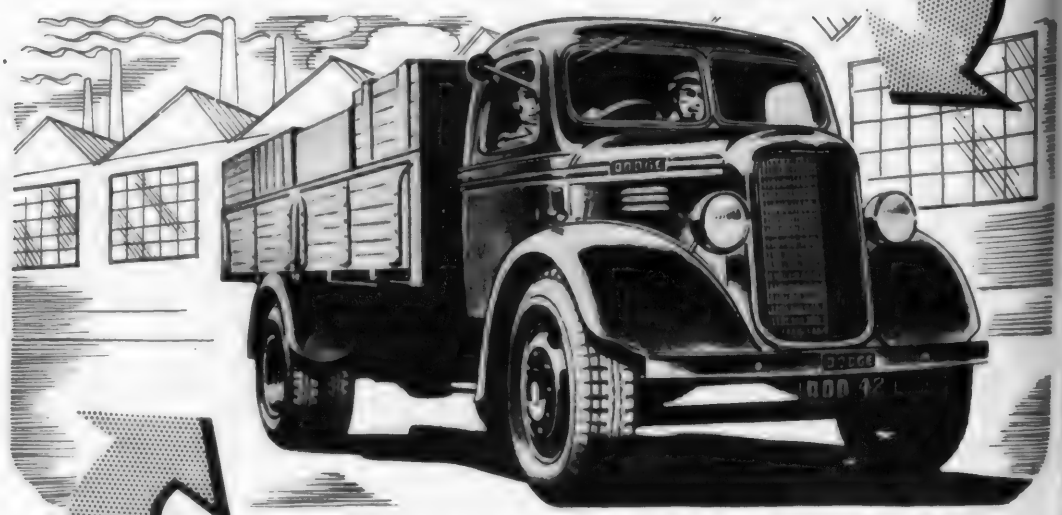
Manufactured from "Perspex" Acrylic Resin sheet, with one welded seam.
The outstanding physical properties of "Perspex," with its high clarity, low water absorption and toughness, make this tubing suitable for numerous Industrial and Research purposes in the Food Industry. Standard range of 38 sizes of tubing from ¾ inches to 4 inches outside diameter. Cylinders from 4 inches upwards.

Solely manufactured by:—

Pat. applied for

EVOLITE PLASTICS LTD., 325/327 LATIMER RD., LONDON, W.10.

"That's the truck I want

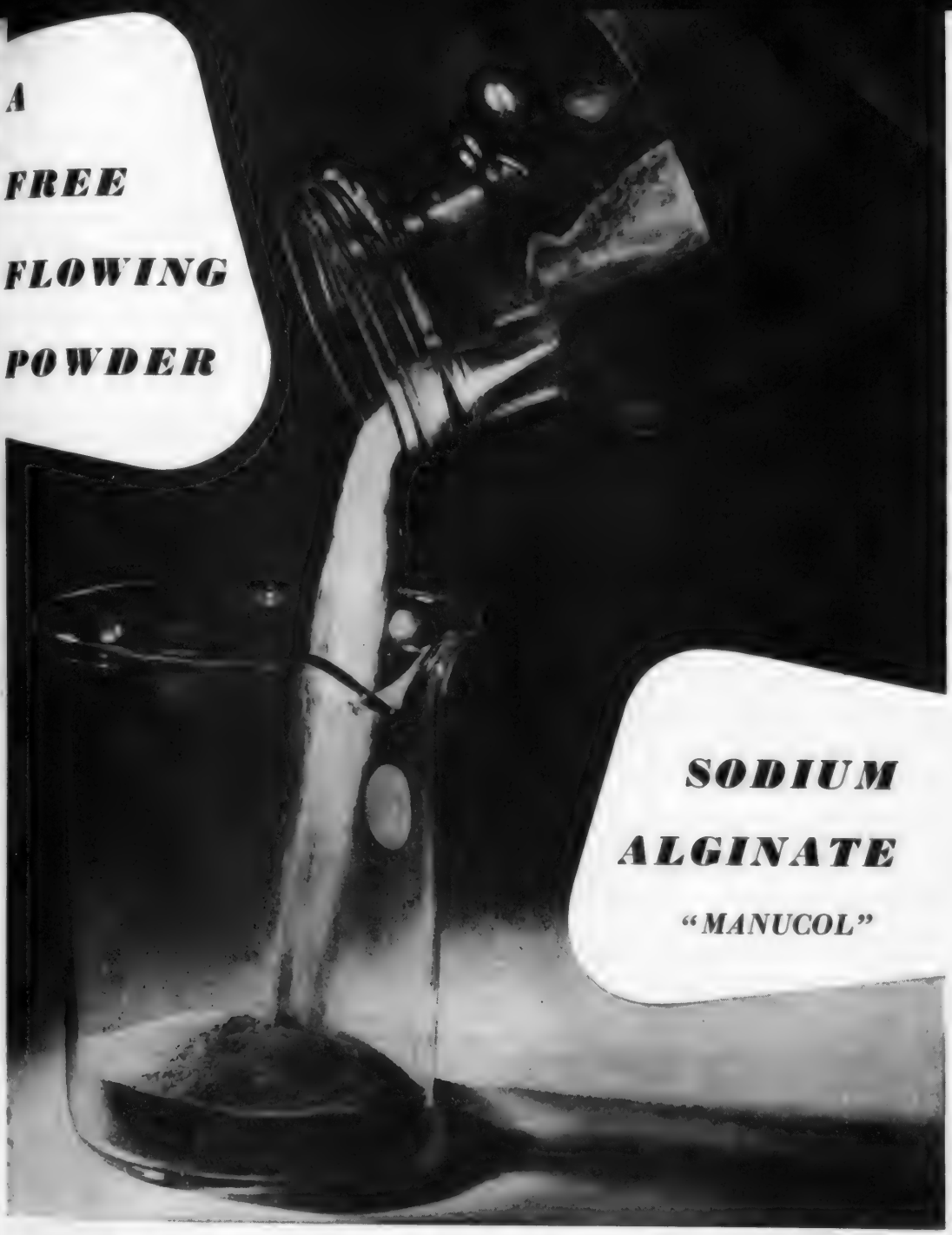


...it's DEPENDABLE...it's DURABLE ...it's a DODGE!"

TRUCKS · VANS · TIPPERS

DODGE BROTHERS (BRITAIN), LTD · KEW · SURREY ● ASSOCIATED COMPANY—CHRYSLER MOTORS LIMITED

A FREE FLOWING POWDER



SODIUM ALGINATE

"MANUCOL"

ALBRIGHT & WILSON LTD

Alginate Department

49 PARK LANE · LONDON W·1 *Tel.: Grosvenor 1311. Works: Oldbury and Widnes*

TBW

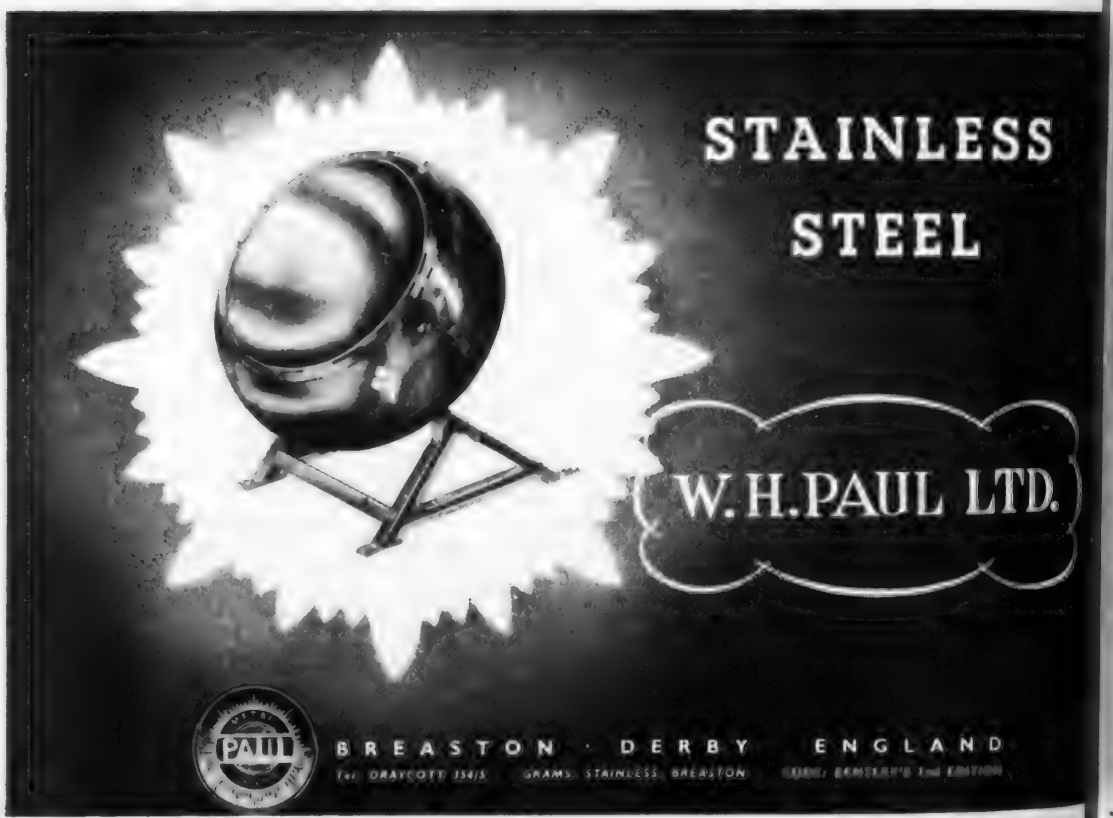
All over Britain

THESE LAST FORTY YEARS
THE NAME **GOSHERON** HAS MEANT
DEPENDABLE **QUALITY** & SERVICE
IN SEALING, MECHANICAL, TYING AND
SPECIAL PURPOSE **TAPES**

JOHN GOSHERON
& CO LTD
GAYFORD ROAD LONDON W12
SHE 3326 (five lines)

TRANSOTAPE cold-sealing cellulose strip
sticks itself—stays stuck

TRANSOTAPE **AQUA-NIL**
100% waterproof and dielectric



" All hope abandon
Ye who enter here."

Certain death awaits all mites, eggs, or larvæ, once they've been introduced to the Entoleter centrifugal machine. This treatment gives effective continuous pest control, without any adverse effect on the actual material. For all dry, free-flowing products it is without doubt the cheapest and simplest method. It uses no heat, gas or chemicals—only the small amount of current to drive the electric motor.

ENTOLETER CENTRIFUGAL MACHINES

(*Made in England*)

Distributed by:

HENRY SIMON

SIMON ENGINEERING GROUP

LIMITED

STOCKPORT

An all-round Plus for YOUR food

As research goes deeper into the mysteries of vitamins and enzymes, the value of the B Vitamin group in releasing energy becomes more and more evident. Yestamin—pure, dried, debittered Yeast—is exceptionally rich in Vitamins B_1 and B_2 and also has a 40 per cent protein content. The Yestamin flavour is piquant and appetising. Supplies of Yestamin are good. Here is an all-round plus for *your* processed food which is of great value at the present time.

Vitamin B_1	2.10	*mgms. per oz.*
Riboflavin (B_2)	1.45	" "
Niacin	9.5	" "

YESTAMIN PURE DRIED YEAST

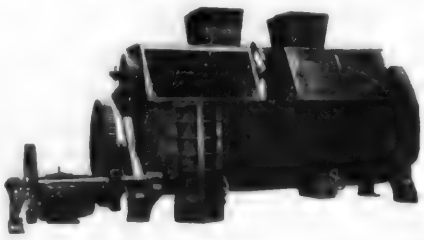
THE ENGLISH GRAINS CO. LTD. BURTON · ON · TRENT

ATLAS Sifters and Mixers

Atlas sifters and mixers give a perfect blend in the shortest possible time.

Experienced engineers with years of practice in the solving of mixing problems, design these machines to produce the highest possible yield with a minimum of labour.

May we send you a catalogue or give you expert advice on any mixing problem?



No. 1506

No. 7a size Patent "Atlas" Sifter and Mixer direct coupled to Electric Motor through Double Spur Reduction Gear and fitted with Twin Sifters.

No. 1497

Size 4 Machine with gear and chain case removed—can be supplied belt-driven or direct motor-driven.

Porteus LEEDS

THE SATISFACTORY WAY

GEORGE PORTEUS & SONS (LEEDS) LIMITED

LEEDS BRIDGE WORKS *Provender Milling Specialists* LEEDS 10

Nylon brushes used in a flour plansifter made by Henry Simon Ltd.

with NYLON { ***No broken tufts***
No lost time
No stoppages

The durable nylon monofilament tufts are resilient to abrasion and constant flexing, they retain their characteristics over a wide temperature range and they are unaffected by modern detergents.

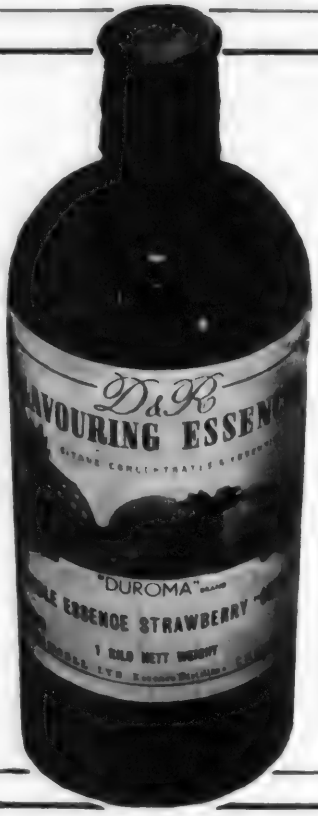
Nylon monofilament has proved its suitability in many food processes, including flour milling, bread making, confectionery, brewing and bottle washing.

Whenever a brush is needed, a nylon brush is best

Nylon monofilament, a product of Imperial Chemical Industries Ltd. is now freely available to all brush manufacturers.

ICI

F.M.75



Are you quite sure your product has reached the highest level possible with today's materials? If you are a user of D. & R. Flavouring Essences you may be, but if you are not yet a user wouldn't you like to see what can be achieved? Let us know what essences interest you and we shall send samples and details. You will be surprised at what you have been missing.

DUBUIS & ROWSELL LIMITED
CROYDON · ENGLAND

The *EXPERTS* in 53 different trades *CAN'T BE WRONG !*

Peerless Mixing Machines have won their way into and are welcomed by the experts in 53 different Trades.

They have been successful with a very wide range of substances under the most varying and exacting conditions.

Whatever the product, if there is somewhere in the manufacturing process a mixing operation to be performed, there is a Peerless machine suitable for the work.

The model illustrated is M.40 which will handle 50 quarts at one mixing, but the Peerless range embraces all types from small bench models to 80-quart machines.

Show us your mixing problem, and we will find the mixer for the job.

PEERLESS

PEERLESS & ERICSSON LTD

6, LYGON PLACE, LONDON, S.W.1 *Telephone:* SLOane 7291

Offices at: BELFAST, BIRMINGHAM, CARDIFF, GLASGOW, LEEDS, MANCHESTER, etc.

THIS MODERN LIGHTING is designed for *you*

Mazdalux Fluorescent Fitting F421

GENERAL OFFICE
SHOP OR STORE

If your work falls into any of the categories listed, this MAZDALUX fitting will meet the special requirements of your work.

MAZDA FLUORESCENT LAMPS ARE ESSENTIAL IN MODERN BUSINESS

1 Because they give better light—light that lets the workers really see.

2 Because they give the same AMOUNT of light for half the current consumption—and everybody knows how electricity costs are mounting.

3 Because Mazda Fluorescent Lighting saves current, and the Government are anxious to conserve every unit of electrical energy and every ounce of coal. In this way we can help to avoid cuts and blackouts by reducing the peak loads.

BTH LIGHTING ADVISORY SERVICE,
Bridle Path, Watford. Telephone: Watford 7701/8.

Change to Fluorescent Lighting now—*and be sure it's Mazda*

MAZDA LAMPS

MAZDALUX FITTINGS

THE NATION'S LIGHT

M.4200b

The British Thomson-Houston Co. Ltd., Crown House, Aldwych, London, W.C.2.

B T-H

"JOHNSON"

FILTER PRESSES

for

SUGAR SYRUPS
FRUIT PULPS & JUICES
WINES
CIDER
BEER
YEAST
SOUP
MEAT EXTRACT
EDIBLE FATS

AND WHERE A REFINED PRODUCT IS REQUIRED

S. H. JOHNSON & CO. LTD.

Telegrams: "FILTRUM" PHONE LONDON

CARPENTERS ROAD
LONDON, E.15

Telephone: MARYLAND 1863

Move with the times

FOULKES'

MOBILE Storage

DOUBLES STORAGE CAPACITY IN SAME AREA

The most up-to date, efficient and hygienic storage system. Every article immediately accessible and not an inch of storage space wasted by unnecessary gangways.

Already supplied to some of the most important animal food manufacturers including:

SPRATTS, SPILLERS, FISONS, VITAMINS Ltd., Etc.

Let us show you how you can increase office and works accommodation without alteration to main structure.

The illustration shows the ends of 40 RANKS OF MOBILE STORAGE with ONLY 5 GANGWAYS. With the usual fixed shelving only 6 RANKS of STORAGE would have been possible for 5 GANGWAYS.

For full particulars write to:

J. GLOVER & SONS LTD., GROTON ROAD, LONDON, S.W.

Telephone: BATtersea 6511

"LITHCOTE" LININGS

CAN BE APPLIED AT OUR WORKS

This is the more general and economical method in cases where the vessel to be lined is reasonably transportable.

We make all classes of equipment in our engineering shops and can quote for new plant with "Lithcote" Linings complete.

OR "IN SITU" AT YOURS

Plant which is too large for transport can be "Lithcote" lined "in situ." This often saves equipment which would otherwise be unserviceable and obviates the disorganization attendant on major removals of plant in a highly organized process-line.

This brochure, which tells the whole technical story, is yours for the asking. May we send you a copy?

AN "ENSECOTE" PRODUCT

NEWTON CHAMBERS & Co. Ltd., THORNCLIFFE, Nr. SHEFFIELD

LONDON OFFICE: GRAND BUILDINGS, TRAFALGAR SQ., LONDON, W.C.2.

FIXED INSTALLATIONS & INDUSTRIAL

Portable VACUUM CLEANERS

Mechanical cleaning of sacks, as illustrated, is only one of the many uses to which B.V.C. Fixed Installations have been adapted with notable success.

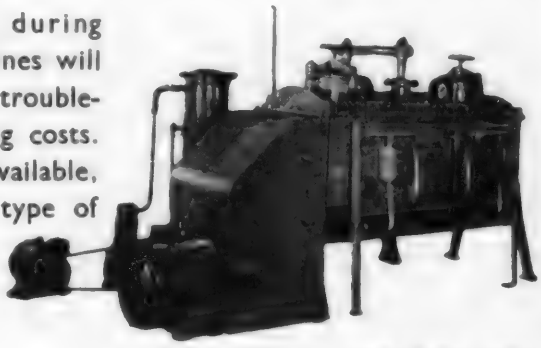
B.V.C. Industrial Portable Vacuum Cleaners perform equally varied duties where space is limited, or mobility is a first consideration. Food Packing Factories, Food Product Manufacturers, Soft Drink Manufacturers, Catering Equipment Manufacturers, among many others, are Trades to which the system has been extended for specialised purposes. Write us about your own problem: our advice is at your service.

BRITISH VACUUM CLEANER & ENGINEERING CO. LTD., Dept. 7/J, Goblin Works, LEATHERHEAD, SURREY. Tel.: ASHTEAD 866

GARDNER'S

have designed MANY machines for the Food Industry

AND MANY are the years during which these machines will give efficient, continuous, trouble-free service at low running costs. Shown here are just two of the many available, for large or small batches, for any type of ingredients.

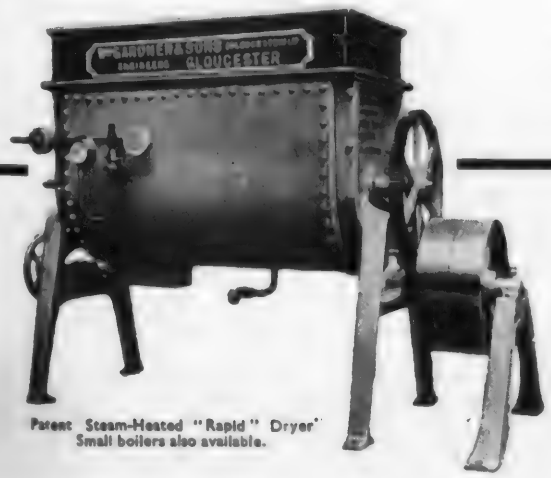


Patent Jacketed Vacuum Dryer, Electrically Heated: can be adapted for Gas or Steam.

MIXERS & SIFTERS
(with Essence Sprayer if required)

MIXERS · DRUM TYPE MIXERS
FLAKING & SHREDDING MACHINES
DRESSERS · DRYERS, ETC.

If there is not a machine to suit your need, one can be designed specially. Let us send you our illustrated catalogue showing extensive range of machines: they can be modified to suit special requirements.



Patent Steam-Heated "Rapid" Dryer" Small boilers also available.

WM. GARDNER & SONS
(Gloucester) LTD.
BRISTOL ROAD, GLOUCESTER
Telephone: Gloucester 21261 (3 lines)
Telegrams: "Gardner, Gloucester"
LONDON:
19 GRAYS INN CHAMBERS,
20 HIGH HOLBORN, W.C.1
Telephone: CHAncery 7347

FOOD

INSTALLATIONS LTD

Better Freezing Means Better Food

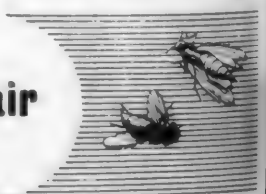
WRITE FOR OUR BULLETINS IF YOU ARE INTERESTED IN QUICK FREEZING

FOOD INSTALLATIONS LTD 34 THROGMORTON STREET LONDON EC2 PHONE: MONARCH 2921 CABLES "FOODINST" LONDON

---

this mist kills cockroaches

This aerosol mist is composed of particles of insecticide so small that they do not burst on impact. An aerosol is therefore a *dry mist*, is highly mobile, and moves freely with the lightest convection currents in confined spaces. This electric Phantomyser mist kills moths, flies and other insects—quickly, cleanly, and cheaply. It does not deposit and cannot spoil food or fabrics. The Phantomyser is portable, and can be plugged in anywhere. It costs from £28.10.0d. Please write for free booklet F.M./1 giving the full Phantomyser story.



the *PHANTOMYSER* clears the air

AEROSOLS LIMITED, 65, OLD BROMPTON ROAD, LONDON, S.W.7 · TEL.: KENSINGTON 1495

. . . seal it with "DUREX" Cellulose TAPE

"DUREX" HEAVY DUTY DISPENSERS are available—they are Tape-Savers, and always ready for instant use. . .

Instantly adhesive . . . No heat or moisture required—simply apply with light finger pressure and it sticks . . . "DUREX" Cellulose TAPE is the perfect seal for packs of any shape or size . . . it is the most satisfactory closure for the moisture-proof type of Cellulose film . . .

Write today for full details and prices.

Transparent and in colours in rolls 72 yds. (2,592") long and in a range of widths.

"DUREX" Cellulose TAPE

Manufactured by DUREX ABRASIVES LTD · ARDEN ROAD · ADDERLEY PARK · BIRMINGHAM 8

T.B.B.

Cyclo

NEW EDIBLE EMULSIFIER "CYCLOCHEM" E.M. 455

Pure white, in slabs and in powder

(Self-emulsifiable)

Guaranteed without any free fatty acid. Fully complying with the Food & Drugs Act.

Ask immediately for samples, leaflet and further information.

"CYCLOCHEM" GLYCERINE MONO-STEARATE (first quality)

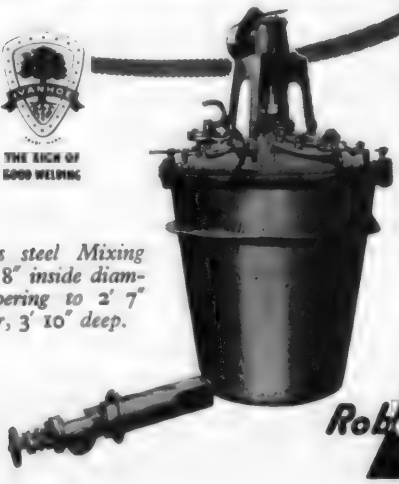
For Home Market and for Export.

CYCLO CHEMICALS LIMITED

WAX REFINERS and CHEMICAL MANUFACTURERS, MANFIELD HOUSE, STRAND, LONDON, W.C.2

Telephone: Temple Bar 5993-6

Welded TANKS MIXERS & PANS in Stainless Steel



THE RICH OF GOOD WELDING

Stainless steel Mixing Pan, 3' 8" inside diameter tapering to 2' 7" diameter, 3' 10" deep.

60-barrel stainless steel Tanks containing filtered and polished beer.

EXPORT ENQUIRIES INVITED

Always Specify **Jenkins**

Robert Jenkins & Co Ltd.

ESTABLISHED 1856

ROTHERHAM

Telephone: 4201 (6 lines).

EXPORTS DEMAND REDUCED PRICES

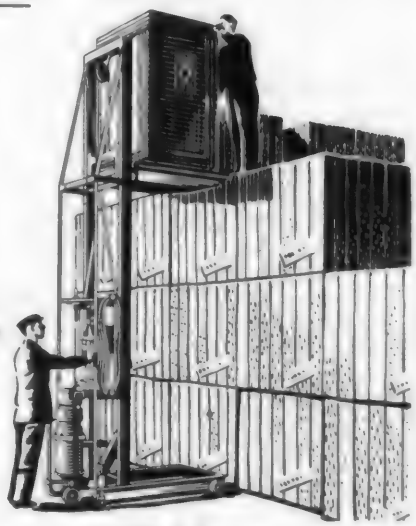
Mechanisation cuts handling costs

Increase sales abroad.

Cut costs.

Mechanise at every stage.

DO IT NOW!



The Collis Stacker

CUT OUT AND POST TODAY

J. Collis & Sons Ltd

MECHANICAL HANDLING ENGINEERS

REGENT SQ., GRAY'S INN RD., LONDON, W.C.1 (*Phone: TERminus 6141*)

We handle _____

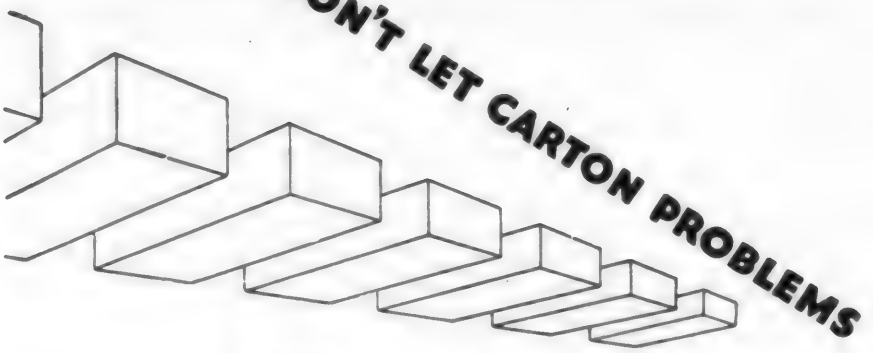
_____ *What have you to offer me?*

Name _____

Firm _____

Address _____

C.3



DON'T LET CARTON PROBLEMS

GROW INTO A BOTTLE-NECK !

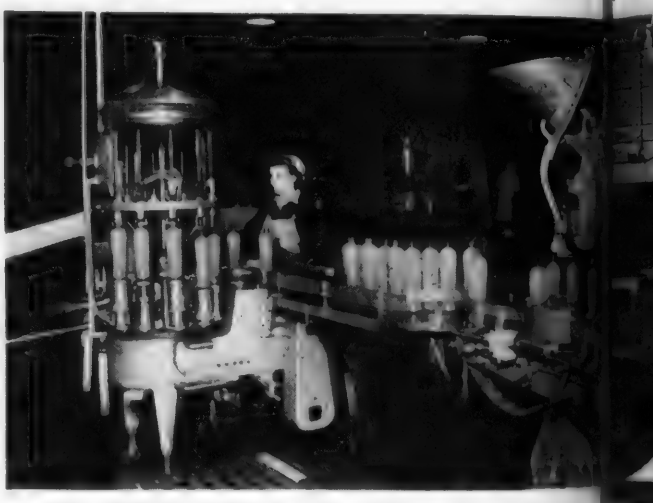
The buyers' market for your product may open sooner than you think. **Now** is the time to get your packaging situation lined up. It will never become a problem—if you tackle it now. Probably you have already some ideas of the form your containers should take. We have a brilliant creative studio ready to put your thoughts, or their own ideas, into tangible form.

HUNT PARTNERS LTD. CLAPTON · LONDON · E·5

Filling Your Needs

AN AUTOMATIC
ROTARY FILLER
for
LIQUIDS, SQUASHES, Etc.

The ALBRO Vacuum-Operated Filler shown in the photograph is a 10-Head Model for Squashes and Cordial—installed at the factory of James Keiller & Son, Ltd., of Dundee.



It's ALL-British! . . . It's one of ALBRO'S wide range of Rotary Vacuum Fillers for liquids and squashes—the result of 30 years' specialization in filling by the low Vacuum method.

Valveless and completely automatic—it embodies exclusive ALBRO features to fill **your** needs with speed . . . accuracy . . . and economy!

YOUR ENQUIRIES ARE INVITED for this and other models in ALBRO'S fine range of Vacuum Fillers for every purpose.

Only ALBRO offers ALL these features

- VALVELESS and Completely Automatic—employing ALBRO'S proved Low Vacuum principle.
- Fills accurately to pre-determined level without waste, overflow or drip—*filled bottles remain perfectly clean and do not require washing.*
- Bright polished stainless steel where in contact with the product.
- Faulty bottles will not fill and are therefore automatically rejected.
- Machine is rapidly cleaned when changing from squashes to clear liquids—rapid adjustment is provided when changing to different sized bottles.
- Non-stop efficiency! Conveyor delivers bottles direct from Washer to Filler and Filler to Capper.
- Output of 10-Head Models on reputed quart bottles—150 dozen per hour.
- Models are available with outputs up to 500 dozen per hour.

ALBRO

FILLERS AND ENGINEERING CO. LTD.

NORTHAMPTON WORKS, WATSON'S ROAD
WOOD GREEN, LONDON, N.22

Telephone: Bowes Park 2217-2218

NEW COMMER
'SUPERPOISE' MODELS

2 TO 5 TONNERS

Built and powered to handle their full rated payloads, these fully-proved trucks have gained an unrivalled reputation for reliability. Now re-styled in the modern manner their specification includes, among other improvements, hydraulic two-leading-shoe brakes, and pre-focussed headlamps.

PRODUCTS OF THE ROOTES GROUP

COMMER CARS LTD. LUTON. EXPORT DIVISION: ROOTES LTD. DEVONSHIRE HOUSE, PICCADILLY, LONDON W.1

Stainless Steel . . .

is increasingly favoured for chemic plant and equipment where purity essential.

Cleaning down is speeded up a metallic contamination is eliminated.

Stainless Steel pays in the long ru and all the time.

Enquiries invited for Stills, Condense and complete distillation units.

METAL PROPELLERS LIMITED

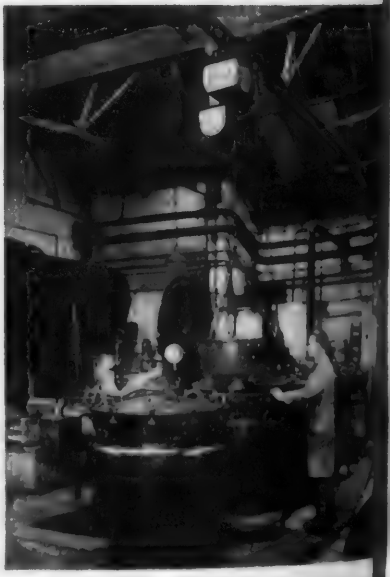
STAINLESS STEEL SPECIALISTS · 74 PURLEY WAY, CROYDON, SURRE

TELEPHONE : THORNTON HEATH 1404 (4 lines) TELEGRAMS : METAPROPS, 'PHONE, LONDO

LIFT IT by KING

in your trade

Picture on right shows a King 1-ton Major Electric Pulley Block installed in a Milk Processing Plant. King Blocks are simple in operation and offer maximum safety ; limit switches being incorporated for both top and bottom lifting positions and to guard against incorrect feeding of chain. Models range in capacity from 5 cwt. to 10 tons. **MANY TYPES UP TO 1 TON CAPACITY EX STOCK.** Write for illustrated booklet on lifting and shifting.



GEO. W. KING LTD.

MAKERS OF ELECTRIC PULLEY BLOCKS, CRANES & CONVEYORS. WRITE FOR ILLUSTRATED BOOKLETS

P.Y.B. WORKS, HITCHIN, HERTS

For the new cleanliness . . .

Into the old world of elbow-grease and rub-and-scrub, Shell Chemicals bring new quick ways to a bright and shining cleanliness . . ." Teepol " and other made-to-measure detergents to lighten the labour, and lower the cost of cleaning almost everything that must be cleaned

One or other of these specialised cleaners is applicable to every cleaning problem in the food factory—floors and walls, wooden vats, copper evaporating pans, steel digesters, glass-lined tanks, operatives' clothing—these new detergents speed and simplify the whole job of maintaining hygiene upon which quality-of-product depends.

Shell Chemicals Limited

112, *Strand, London, W.C.*2

Write for Technical Information Sheets regarding the many uses of ' Teepol ' (*Registered Trade Mark*).

C101

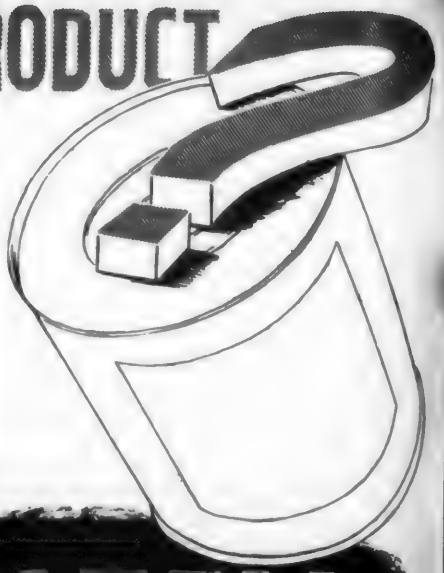
IS THIS YOUR PRODUCT

IT CONTAINS

EXTRA FOOD VALUE AND EXTRA FOOD FLAVOUR

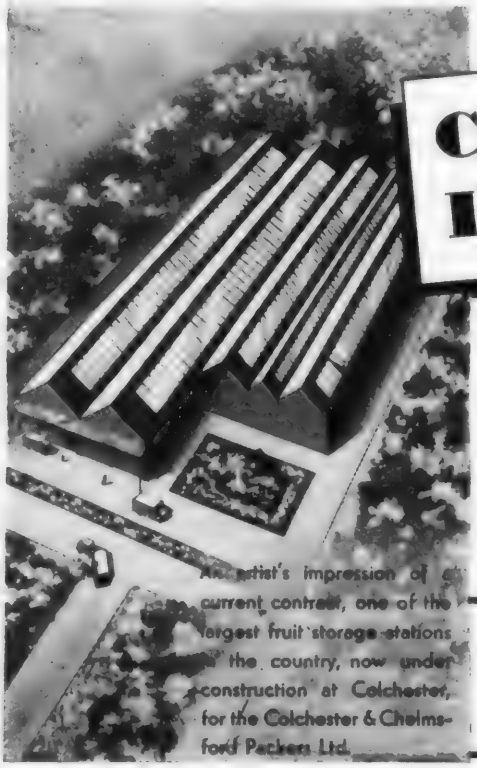
When the contents are tasted, that extra food flavour will be noticed immediately. The extra nutrition and health value will also be there. These two combinations are difficult to find to-day—but they can be there, if you use "YEATEX." This concentrated, palatable Yeast Extract manufactured by the Trent Yeast Extract Co., Ltd., of Burton-on-Trent from brewers' yeast, should be used in the manufacture of soups, cooked meats, sandwich spreads and other savoury preparations.

IT CONTAINS



YEATEX

Sales Office: FREDK. BOEHM LTD., 19 Bentinck Street, London, W.1. *Telephone:* Welbeck 7933



An artist's impression of the current contract, one of the largest fruit storage stations in the country, now under construction at Colchester, for the Colchester & Chelmsford Packers Ltd.

COLD STORAGE INSULATION *for* FOOD

Dependable food storage means efficient insulation . . . . and that's where you profit from our 74 years' experience. Whatever your requirements may be — in storage chambers, Service Cabinets or Sectional Cold Rooms — consult us with confidence. Catalogue on request.

T. Smith & Company

INSULATION ENGINEERS

BURTON-ON-TRENT. ESTABLISHED 1874.

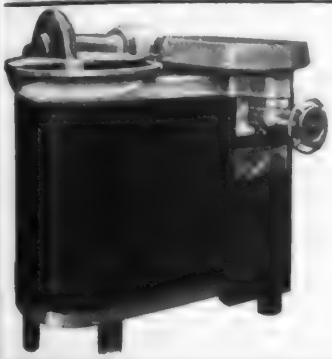
B2227

Swallow

THE WORLD'S FINEST

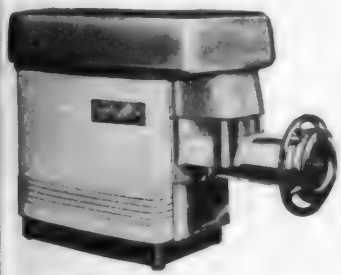
FOOD PREPARING MACHINES

With their modern, distinctive, hygienic appearance, Swallow Food Preparing Machines offer for the first time features that have been demanded by the food industry for years; features only made possible by the resources of one of the finest equipped engineering plants in Britain. Swallow machines are backed by our 5-Year Fully Comprehensive Maintenance Service. May we send you further details."



Swallow
COMBINATION BOWL-CUTTER MINCER

represents the biggest stride forward ever made in the development of modern equipment for the butcher, caterer and manufacturer of food products.



Swallow
ELECTRIC MINCER

with its hygienic appearance, automatic safety clutch, reversing switch, oil-bath gearbox, filler attachment and instant dismantling for cleaning, is indeed "the talk of the trade".

Swallow
ELECTRIC GRAVITY-FEED SLICER

handles all kinds of cooked or uncooked meats, hot or cold, as well as bread, vegetables, firm fruit, cheese, fish and almost everything that requires slicing.

Swallow ELECTRIC MIXER

Scientifically made for scientific mixing, the Swallow Mixer produces the ideal velvet-texture cake mixture, prepares doughs of all kinds, beats eggs, meringues, and icings, whips cream, mixes puddings, and provides creamy-fluff mashed potatoes. With the aid of additional attachments, to be available in due course, it performs innumerable duties in the kitchen, including mincing, filling sausages, slicing vegetables and firm fruit, crumbling bread, grating cheese and straining the ingredients for soup.

In the modern kitchen it is the finest general-purpose machine yet made when catering for any number up to 250 people.

SWIFT AND SWALLOW LTD.
(SWALLOW ENGINEERING CO.)

CENTURY WORKS, LEWISHAM, LONDON, S.E.13. TIDEWAY 3232

Anybody in the office got four 2½° stamps?

THEY'VE run out of stamps again, and there are four urgent letters just about to miss the post. Tomorrow the accountant will have his usual struggle to put the post-book straight. The best place to put a post-book straight, is straight in the waste-paper basket. Then install a Neopost Franking Machine. It prints its own stamps! It never runs out of them! It keeps its own record! The post leaves the office sooner and goes at once to the sorters to catch the early train. A Neopost costs very little and even the smallest business will find it pays its way. Approved by the Postmaster-General. Send for particulars now.

Eliminate postage stamps

neopost

FRANKING MACHINES

Post early in the day — the Neopost way

RONEO-NEOPOST LTD · VICTORIA HOUSE · SOUTHAMPTON ROW · LONDON WC1

ONE GLANCE AND YOU KNOW...

You fill the container as shown, glance at the dial and get an immediate check upon the moisture content of grain, seeds, peas or whatever similar foodstuffs you may be examining.

This compact, portable, self-contained electrical moisture meter has been developed by N.P.L. in conjunction with Baldwin Instrument Co., Ltd.

The aim was to make available to Grain & Seed Merchants, Grain Dryers, Food Manufacturers, etc., a simplined and rapid means of moisture determination.

Anyone can use this instrument : one simply obtains moisture content by referring the meter reading to a calibration chart.

BALDWIN

"N P.L." MOISTURE METE

Fully descriptive and illustrated leaflet on request

BALDW'N INSTRUMENT COMPANY LIMITE

BROOKLANDS WORKS, PRINCES ROAD, DARTFORD.

Telephone: Dartford 2909

Process your soups in Nickel Equipment

For nickel ensures that the purity of your product is safeguarded; and for rapid heat transference, it is superior to other metals, having comparable strength and corrosion-resistance.

HENRY WIGGIN AND COMPANY LTD BIRMINGHAM 16

BWF6

ELECTRIC MOTORS *from stock*

A.C. — 3 PHASE

H.P.	REVS.	VOLTS	TYPE	REF.	H.P.	REVS.	VOLTS	TYPE	REF.
5	1500	440	S.C., S.P.	R.E. 83	12	710	400	S.R., S.P.	DS. 15
5	720	400	S.C., S.P.	DS. 3	12½	965	400	S.C., S.P.	F. 3214
5	485	400	S.C., S.P.	DS. 7	12½	2880	400	S.C., S.P.	F. 2750
5	950	400	S.C., S.P.	E. 267	15	1445	400/440	S.C., S.P.	F. 2961
6	950	400	S.C., T.E.	R. 319	20	720	400/440	S.C., S.P.	Alt. 331
6	1430	400/440	S.C., S.P.	WB. 180	20	1400	420	S.C., S.P.	Alt. 161
7½	1425	400	S.C., S.P.	F. 2966	20	575	400	S.R., S.P.	R. 318
7½	1745	220/440	S.C., S.P.	R. 87	25	730	400/440	S.C., T.E.	Alt. 553
8	3000	400	S.C., T.E.	WB. 179	25	1440	360	S.R., S.P.	R. 286
8	1460	400/440	S.C., S.P.	Alt. 465	35	1440	400	S.C., S.P.	F. 3179
9	1400	400/440	S.C., S.P.	R. 10	40	960	400	S.C., S.P.	F. 2434
10	1000	420	S.C., S.P.	Alt. 452	45	1470	400/440	S.R., T.E.	F. 2840
10	1425	400	S.C., S.P.	F. 2965	50	1460	400/440	S.R., S.P.	F. 2831

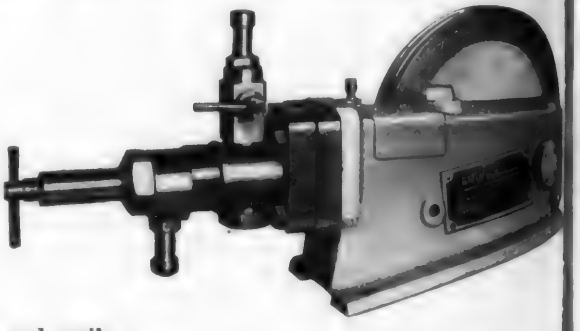
★ We have many other motors in stock, ranging from fractional to 200 h.p. both *new* and *reconditioned*, and would be glad to forward details on receipt of your requirements.

COX & DANKS Ltd.

LONDON	*FAGGS ROAD, FELTHAM, MIDDLESEX*	*'Phone: FELTHAM 3471*
BROADHEATH	*nr. MANCHESTER*	*'Phone: ALTRINCHAM 3711*
BIRMINGHAM	*LANGLEY GREEN, OLDBURY*	*'Phone: BROADWELL 2011*
SHEFFIELD	*WADSLEY BRIDGE*	*'Phone: OWLERTON 44291*

WEIR HOMOGENISERS

A range of six sizes, 10 to 1,250 gallons per hou



THE "JUNIOR" MODEL

A small capacity machine to handle approximately 10 gallons an hour. Particularly suitable for commercial use where only small batches of emulsion are required, and also for laboratory experimental work.

Simple design, easy to dismantle, and easily cleaned. Unaffected by acids or alkalis. No risk of bacterial contamination in foodstuffs. Has all advantages of larger models of Weir Homogenisers.

Write for Publication No. I. D. 133

G. & J. WEIR LTD
CATHCART : GLASGOW

For Food STORAGE and PROCESSING...

Butterfields

Butterfields fabricate to Food Manufacturers' Specifications in Stainless Steel and Aluminium.

- TANKS
- VATS
- VESSELS
- TROUGHS
- TRAYS
- TROLLEYS

Above — A Milk Measuring Tank. Left — Vegetable Trolley, in Stainless Steel.

STAINLESS STEEL Equipment

W. P. BUTTERFIELD LTD., SHIPLEY, YORKS

Telephone: Shipley 52244 (6 lines)

LONDON: Africa House, Kingsway, W.C.2 Phone: HOLborn 1449

ELECTRIC MOTORS from stock

A.C. — 3 PHASE

H.P.	REVS.	VOLTS	TYPE	REF.	H.P.	REVS.	VOLTS	TYPE	REF.
5	1500	440	S.C., S.P.	R.E. 83	12	710	400	S.R., S.P.	DS. 15
5	720	400	S.C., S.P.	DS. 3	12½	965	400	S.C., S.P.	F. 3214
5	485	400	S.C., S.P.	DS. 7	12½	2880	400	S.C., S.P.	F. 2750
5	950	400	S.C., S.P.	E. 267	15	1445	400/440	S.C., S.P.	F. 2961
6	950	400	S.C., T.E.	R. 319	20	720	400/440	S.C., S.P.	Alt. 331
6	1430	400/440	S.C., S.P.	WB. 180	20	1400	420	S.C., S.P.	Alt. 161
7½	1425	400	S.C., S.P.	F. 2966	20	575	400	S.R., S.P.	R. 318
7½	1745	220/440	S.C., S.P.	R. 87	25	730	400/440	S.C., T.E.	Alt. 553
8	3000	400	S.C., T.E.	WB. 179	25	1440	360	S.R., S.P.	R. 286
8	1460	400/440	S.C., S.P.	Alt. 465	35	1440	400	S.C., S.P.	F. 3179
9	1400	400/440	S.C., S.P.	R. 10	40	960	400	S.C., S.P.	F. 2434
10	1000	420	S.C., S.P.	Alt. 452	45	1470	400/440	S.R., T.E.	F. 2840
10	1425	400	S.C., S.P.	F. 2965	50	1460	400/440	S.R., S.P.	F. 2831

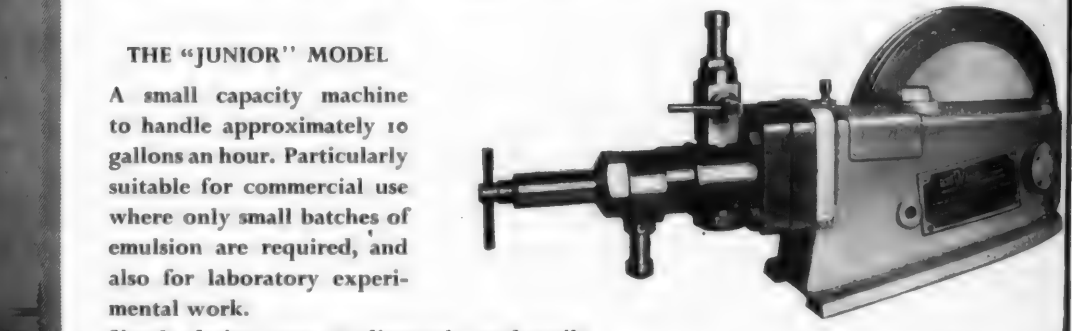
★ We have many other motors in stock, ranging from fractional to 200 h.p. both *new* and *reconditioned*, and would be glad to forward details on receipt of your requirements.

COX & DANKS Ltd.

LONDON -	*FAGGS ROAD, FELTHAM, MIDDLESEX*	*'Phone: FELTHAM 3471*
BROADHEATH -	*nr. MANCHESTER*	*'Phone: ALTRINCHAM 3711*
BIRMINGHAM -	*LANGLEY GREEN, OLDBURY*	*'Phone: BROADWELL 2011*
SHEFFIELD -	*WADSLEY BRIDGE*	*'Phone: OWLERTON 44291*

WEIR HOMOGENISERS

A range of six sizes, 10 to 1,250 gallons per hour



THE "JUNIOR" MODEL

A small capacity machine to handle approximately 10 gallons an hour. Particularly suitable for commercial use where only small batches of emulsion are required, and also for laboratory experimental work.

Simple design, easy to dismantle, and easily cleaned. Unaffected by acids or alkalis. No risk of bacterial contamination in foodstuffs. Has all advantages of larger models of Weir Homogenisers.

Write for Publication No. I. D. 133

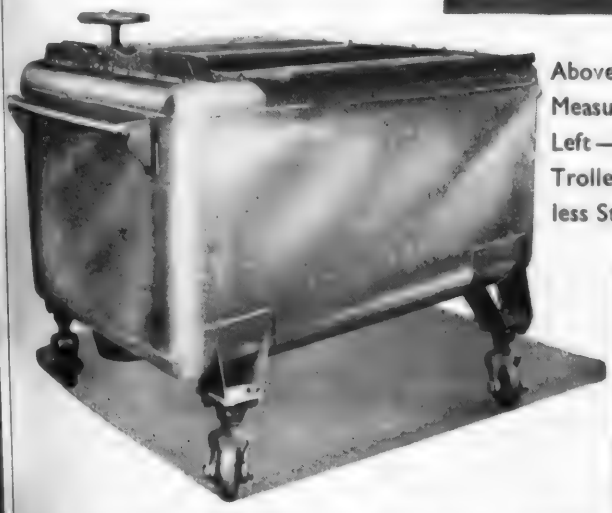
G. & J. WEIR LTD
CATHCART : GLASGOW

For Food STORAGE and PROCESSING ...

Butterfields

Butterfields fabricate to Food Manufacturers' Specifications in Stainless Steel and Aluminium.

TANKS
VATS
VESSELS
TROUGHS
TRAYS
TROLLEYS



Above — A Milk Measuring Tank. Left — Vegetable Trolley, in Stainless Steel.

STAINLESS STEEL Equipment

W. P. BUTTERFIELD LTD., SHIPLEY, YORKS
Telephone: Shipley 52244 (6 lines)
LONDON: Africa House, Kingsway, W.C.2 Phone: HOLborn 1449

In these days of Austerity and Monotony of Diet, the introduction of a NEW "REIGATE BRAND" FLAVOUR, expressly manufactured for FOODSTUFFS, will enable YOU to give Variety to YOUR Customers.

BUTTERCREAM FLAVOUR 1097

gives that delightful Creamy Flavour which has been missed for so long.

Available in both ESSENCE and POWDER form.

For Samples and Price write:

WHITE, TOMKINS & COURAGE LTD.

REIGATE • SURREY *Phone: Reigate 2242/3*

"SEE WHAT HAPPENS WHEN YOU FORGET YOUR Sternocleanse!"

FREE WORKS POSTERS

like this advertisement will constantly remind your workers of dermatitis dangers. The words "Sternocleanse Posters" written on your note-heading and posted to us will bring you details of STERNOCLEANSE, the anti-dermatitis cream, and its round-the-year Works Poster Scheme.

Your Guard against DERMATITIS—if used ALWAYS

STERNOL LTD • ROYAL LONDON HOUSE • FINSBURY SQUARE • LONDON E.C.2 • MONarch 3871-5

CONES AND SOCKETS

We can deliver the following sizes in borosilicate glass from stock: B14, B16, B19, B24, B29, B34

Angle Drip Cones

made in sizes B14, B19, and B24 in borosilicate glass from stock

This modification to the usual standard cones has been evolved to meet *particular cases*, as, for example, where it is necessary to avoid contamination at a lubricated joint or where it is required to assess the rate of distillation by counting drops.

The angle drip extension has been designed with as little restriction to the bore of the cones as possible. Care has been taken to prevent any form of "pocket" which would hold up liquid flow even when using a distillation angle only 10° below horizontal.

Liquid draining from the end of these cones is clearly visible so that the rate of flow can be readily ascertained, and the shape of the Angle Drip ensures a steady formation of drops at one point. Its strong "fired" tip is well away from any lubricant that may be needed on the ground joint and also sufficiently clear of the side of the socket to allow formation of easily visible defined drops instead of the usual continuous trickle.

QUICKFIT & QUARTZ Ltd.

INTERCHANGEABLE LABORATORY GLASSWARE
INDUSTRIAL PLANT IN GLASS

Head Office : **1, Albemarle Street, Piccadilly, London, W.1.** Telephone : Regent 8171

Works : "Triplex" Works, King's Norton, Birmingham. Telephone : King's Norton 2031 (5 lines)
"Quickfit" Works, Mill Street, Stone, Staffs. Telephone : Stone 481

On the tar *very time*

You cannot afford to ... s when it comes to adhesives for Packaging and La' ... niformity of quality, setting speed and 'stick' are ... factors in keeping production rolling
By specifying KEYS ... t an consistency from one o... . Th· adhesive are on the target ...

KEYSTONE BRAND

GLUES · GUMS · PAS

DUCHÉ & KNIGHT LTD. · LONDO

ADMUL

GLYCERYL MONOSTEARA

We regret we are still unable to 'quote for immediate deliveri

Advita Limi...

2 Kingscote Street, London,

ADL7-8

THE PUMP THAT'S NOT AFRAID OF WATER

What's the good of a pump that *is*?—true enough, but there's something about a SUMO that's particularly bold. It all lies in that word 'submersible', for the SUMO Pump, electric motor and all, *goes right down into the water*, and works away at the bottom of the well. All you see at the well-head (if in fact there's anything to see) are the rising main and the electric cable which supplies the power.

What are the advantages? Here are some:—

- *No driving shafts, rods, bearings, cranks or gears to bother about, in or out of the well.*
- *No need for foundations; no need for a pumphouse.*
- *Power is close-coupled, and loss is negligible.*
- *Installation and withdrawal are simple, speedy and relatively inexpensive; so is routine servicing.*
- *No priming is required; no suction troubles arise.*
- *There is no noise.*

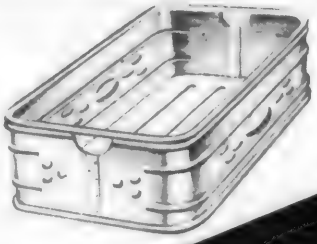
There are SUMO Submersible Pumps for volumes between 200 and 40,000 gallons per hour. They work between six and ten thousand hours without servicing. They're a Chance product—built by the same people who've made most of the world's lighthouses.

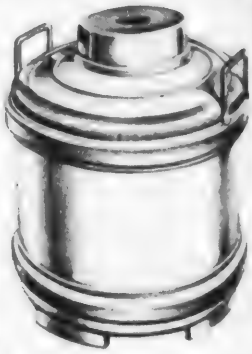
SUMO P[illegible]S LTD. (Proprietors Chance Brothers Limited)

DEPT. U, LIGHTHOUSE W[illegible]HWICK, BIRMINGHAM. 'Phone: West Bromwich 1051

A Chance PRODUCT

Manufacture—Deci[illegible]

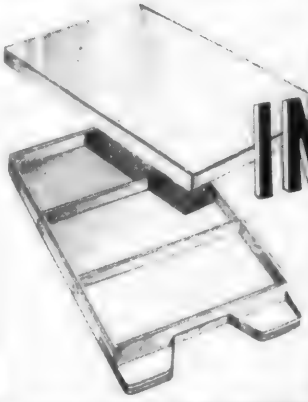


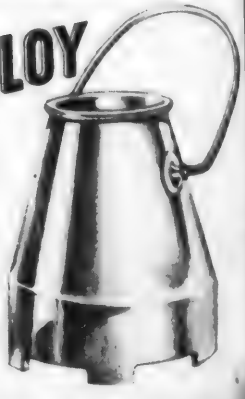


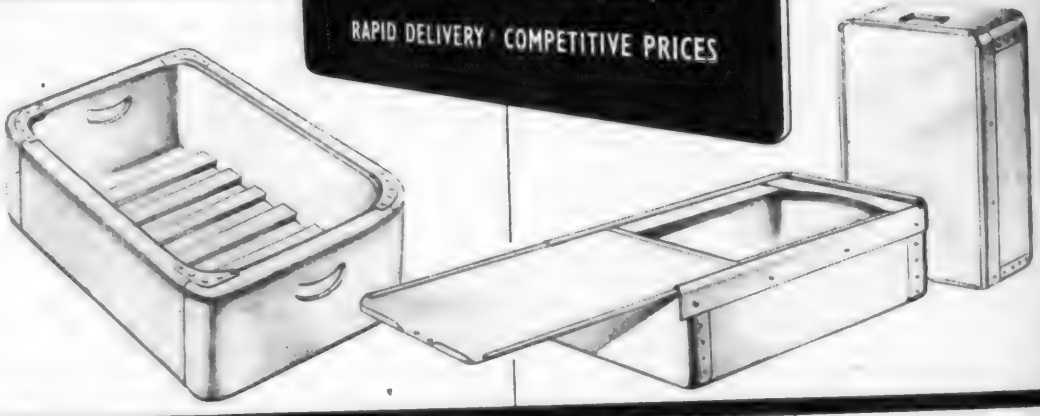
FOOD CONTAINERS IN ALUMINIUM ALLOY

We have a wide range of vessels to choose from—we also specialise in the development of non-standard containers for your particular purpose

RAPID DELIVERY · COMPETITIVE PRICES







WARWICK PRODUCTION Co Ltd

SALTISFORD WARWICK

TELEPHONE WARWICK 693

FOOD MANUFACTURE

Vol. XXIII. No. 12 · Published Monthly · December 1, 1948

CONTENTS

	Page
Editorial	541
Baby Foods at Greenford	545
Electronic Preservation of Foods. *F. J. Erroll, M.A., A.M.I.E.E., M.P.*	549
Food Processing Developments	550
Ascorbic Acid in Fruit Processing	551
Diet and Disease	553
Ministry of Food—Statutory Rules and Orders	556
Big Game Fishing Creates New Industry	557
The Chemist in the Flour Mill	560
Automatic Control in Food Processing. Part II. *Leo Walter, Dipl.Engr.*	563
Bakery Research	565
Dairy Bacteriology	566
Food in the Faroes	567
Advice to Bakers	567
Trade News	568
Information and Advice	583
Recent Patents, Trade Marks and New Companies	584
Index for 1948	585

Published by Leonard Hill Limited, 17, Stratford Place, London, W.1. Mayfair 7383. 1 year $4; 2 years $6.50; 3 years $8. Sterling rates: 1 year 20s.; 2 years 30s.; 3 years 40s.

THE NEW *Weston* PHOTOMETER

FOR *Increased Production*

Correct lighting ensures the maximum production in industry. By correcting inefficient lighting you can increase production, minimise waste, reduce accident risks and preserve the health of the individual. It is practically impossible to judge whether lighting is adequate—the surest method is to measure the light with a Weston Model S85 Photometer. This pocket size instrument has two ranges of 0 to 25 and 0 to 125 foot candles and is as easy to read as a watch. Sensitive and reliable, it is robust and precision built. Please write for details.

FOR HOMES, OFFICES, FACTORIES, SCHOOLS, MILLS, WAREHOUSES, PRINTING WORKS, SHOPS, SHOWROOMS, STUDIOS, BAKERIES PUBLIC BUILDINGS, HOTELS, LAUNDRIES, MODEL FARMS AND DAIRIES, GARAGES, SOCIAL CENTRES, INDUSTRIAL PLANTS, RESTAURANTS, LABORATORIES, HOSPITALS, ETC.

SANGAMO WESTON LIMITED

Great Cambridge Road • Enfield • Middlesex

Telephone : Enfield 3434 and 1242

QUICK FROZEN FOOD HAS *Natural Freshness* WHEN PRODUCED IN

the famous

Jackstone Junior Froster

A complete unit · Entirely automatic · Low running cost · Mobile and compact

JACKSTONE FROSTER LTD

1, HUTTON ROAD, GRIMSBY
Telephone: Grimsby 5107. Telegraphic Address: "Industries, Grimsby"
2, ROYAL EXCHANGE, CORNHILL, LONDON, E.C.3
Telephone: Mansion House 5819. Telegrams: "Seasparkle, Phone, London"

BIG NEWS FOR FOOD PACKERS!

HERMETICALLY-SEALED PAPER BAG CUTS COSTS, PROTECTS FLAVOUR

MANUFACTURED by E. S. & A. Robinson Ltd., of Bristol, this new air-tight FLAV-O-TAINER is the greatest advance in packaging technique since the development of vacuum-packing. Packed in this sensational container, even the most delicately flavoured foods keep their natural freshness. And the cost — compared with vacuum-packing — is negligible.

The Flav-o-Tainer bag has an inner lining of PLIOFILM, the new moisture-vapour-proof material perfected by Goodyear. For every kind of package requiring to seal wanted moisture IN, and unwanted moisture OUT, Goodyear's transparent PLIOFILM is now recognised as the ideal material for the job — keeping all good things at their best.

3-WAY PROTECTION AGAINST AIR, MOISTURE AND LIQUIDS

by GOODYEAR

★ *Pliofilm is a trade mark of the Goodyear Tire and Rubber Company*

For full information about PLIOFILM write to:—

PLIOFILM, GOODYEAR TYRE & RUBBER CO. (GT. BRITAIN) LTD. DEPT. (F.M.) WOLVERHAMPTON

A working partner for the Milk Industry

A Dictionary of Dairying

A standard reference work for which Dairymen have long been waiting

J. G. Davis, Ph.D., D.Sc., F.R.I.C.

Over 800 pages, 8½ × 5½ ins. Illustrated. Provisional Price 50s plus postage (Inland 9d, Overseas 11d)

Dr. Davis, formerly bacteriologist of the National Institute of Research in Dairying at Reading, and now technical director of the Express Dairy Co. Ltd., has compiled a thoroughly comprehensive compendium of dairy science and practice which will prove of immense interest and assistance to all engaged in the industry.

The literature of dairy practice and technology has never been very ample. A limited number of books have been published on these subjects generally, and some on special aspects, but most are now out of print, if not out of date. Dr. Davis's work is an encyclopædia covering every aspect of the subject fully and with authority.

It gives just the facts and data, so often required at short notice, by the busy man; executive, manager, engineer, chemist, in any business, however large, however small. It is indispensable to the student.

The first edition runs to approximately 380,000 words, and in addition is copiously illustrated with 120 photographs and 60 diagrams. There are also many up-to-date tables summarising technical matters.

To facilitate reference the work is arranged in alphabetical form. The references are entirely up-to-date and exhaustive cross-references are given.

Some of the many subjects covered are: **Cheese. Classification of Bacteria. Cleansing and Sterilising of Plant. Condensed Milk. Detergents. Evaporated Milk. Ice Cream. Laboratory Control. Lactic Acid Bacteria. Legal Aspects. Management of Country Creameries and Pasteurising Depots. Milk Powder. Pasteurisation and Resazurin and Other Tests for Milk. There is also a comprehensive catalogue of Dairy Supplies and Equipment, and a valuable bibliography of recent papers on dairy technology has been included.**

A Dictionary of Dairying **will be regularly revised, and new editions published, as required, with the object of keeping the work thoroughly up-to-date.**

Publication of the first edition has been provisionally fixed for January 1949

ORDER NOW ! and make sure of your copy today

Order through your usual Bookseller, or from the Book Department:

Leonard Hill Limited, 17 Stratford Place, London, W.1, England

TEASHOPS AMUSEMENT PARKS RESTAURANT CARS
CANTEENS RESTAURANTS MILK BARS
PUBLIC HOUSES GENERAL STORES GROCERY SHOPS

The public safety
AND
THE FOOD & DRUGS ACT
demand hot water

DELICATESSEN BOARDING HOUSES BAKERS
HOTELS ICE CREAMERIES CAFES DAIRIES
CONFECTIONERS GREENGROCERS PATISSERIES
SANDWICH COUNTERS SNACK BARS FISH SHOPS

LOCAL GOVERNMENT AUTHORITIES are emphasizing the provisions of the Food & Drugs Act which require that HOT WATER should be available for cleansing purposes wherever food is handled.

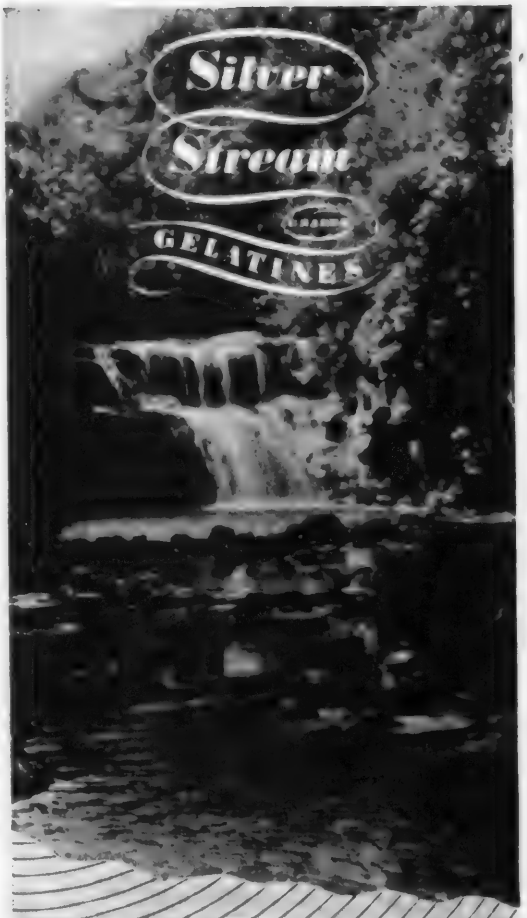
ASCOT INSTANTANEOUS GAS WATER HEATERS provide a continuous supply of HOT OR BOILING WATER instantly and economically, for Gas is only used when hot water is required.

ASCOT

Wherever food is handled cleanliness is *easier* with an **ASCOT INSTANTANEOUS GAS WATER HEATER**

Technical advice and full information from all Gas Undertakings, or direct from

ASCOT GAS WATER HEATERS LIMITED
43 PARK STREET · LONDON · W1
BRANCHES: MANCHESTER · BIRMINGHAM · BRISTOL
BOURNEMOUTH · CAMBRIDGE · GLASGOW



"By shallow rivers,
to whose falls
Melodious birds
sing madrigals."
Marlowe

* * * * * * * * * * *

Lovers of the Yorkshire dales will recognise Kisdon Force, in Swaledale. The makers of 'Silver Stream' graded and branded gelatines of controlled quality hope that the picture will bring a breath of the countryside into your office.

ALFRED ADAMS & CO. LTD.,
Reliance Works,
West Bromwich,
Tel.: 0203 (5 lines)

NEWS which will make money for you!

South Wales Condenseries offer their **NEW & VASTLY IMPROVED**

SWEETENING MATERIAL

South Wales Condenseries Limited

SeW-Crose

• THE NEW SWEETENING SYRUP •

★ A syrup of unsurpassed quality and sweetening power.
★ A syrup for which you will find many profitable uses whether you are baker, canner, confectioner, pickle or ice cream manufacturer.

A postcard brings a Free Sample and price particulars.
No restrictions. IMMEDIATE DELIVERY.
In your own interests, please write now to:—
SOUTH WALES CONDENSERIES LTD.
Dragon Works, South Road, Trading Estate.
Bridgend, Glamorgan.

STURGE

CITRIC

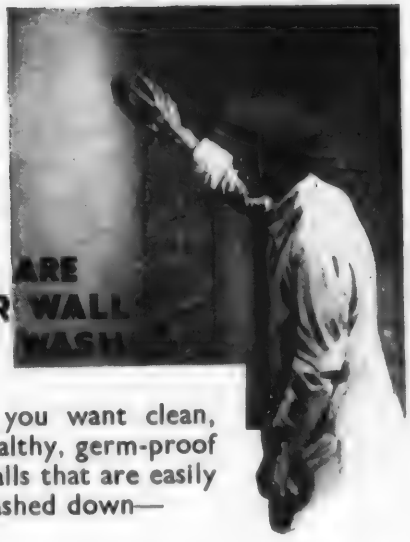
ACID

JOHN & E. STURGE
LIMITED
1 WHEELEYS RD · BIRMINGHAM 15
Manufacturers of Fine Chemicals since 1823

Solid drawn seamless steel tubes, stainless steel tubes, fabricated and manipulated. Bright drawn and turned steel bars for all purposes.

TALBOT-STEAD

TALBOT-STEAD TUBE CO. LTD.,
GREEN LANE, WALSALL



YOUR ARE WALLS EASILY WASHED

If you want clean, healthy, germ-proof walls that are easily washed down—

Permoglaze your walls

Here is a liquid coating for walls, etc., that is easily applied, gives a clean, smart appearance, has many practical advantages, and maintains those hygienic conditions which are an essential feature of modern Food Manufactories.

Used by leading firms in the Food Manufacturing trades throughout the country.

Send for descriptive booklet FO/208 and colour card.

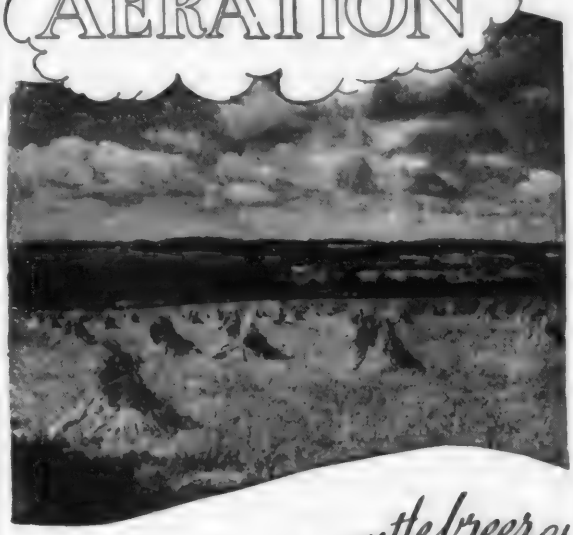
SOLE MANUFACTURERS:

GLAZEBROOKS LTD

TYSELEY · BIRMINGHAM 11

Phone: Acocks Green 0664
Grams: Roglaze, Birmingham

AERATION



As light as the gentle breezes

That is aeration at its best—resulting from the use of a perfect baking powder, giving that light and airy texture to pastries, cakes, and scones, so gratifying to the most exacting housewife.

Sodium Acid Pyrophosphate is the ingredient which "controls" aeration in the Baking Powder and ensures its CO_2 being released slowly during the baking period more gradually than any other similar ingredient.

Make certain to order Sodium Acid Pyrophosphate and be sure of producing the perfect baking powder . . . Your enquiries are cordially invited and will receive the immediate attention of our Technical Staff.

SODIUM ACID PYROPHOSPHATE

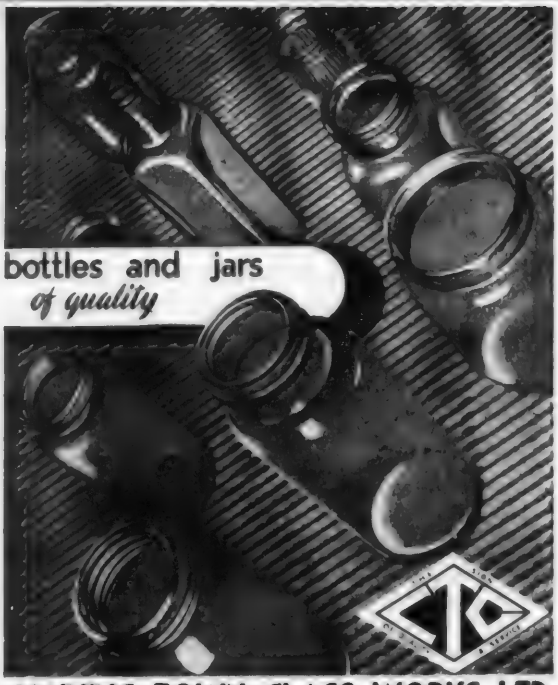
"Clover" BRAND

For "Light as Air" Baking Powders!

Send your enquiries to

ASSOCIATED PHOSPHATE MANUFACTURERS LTD.

LUTON, BEDFORDSHIRE



CANNING TOWN GLASS WORKS LTD.

NEW BRIDGE ST. HOUSE, 30-34 NEW BRIDGE ST., E.C.4

Telephone: CENTRAL 5342-5 *Telegrams: DRYAD, LUD, LONDON*

WORKS: CANNING TOWN, E. 16 and QUEENBOROUGH, KENT

DAVIS

STANDARD

AGAR

(NEW ZEALAND AGAR-AGAR)

for—

- EXCEPTIONAL GEL STRENGTH
- UNIFORMITY
- PURITY
- COLOUR

DAVIS GELATINE LTD

29-31 MITRE ST., LONDON, E.C.3

Telephone - Avenue 1737 and 4105

Telegrams - Gelatine, Ald., London

"Valco"

FILLING MACHINES

to suit all needs

Our range of FILLERS includes all types: Spiral, Density, Rotary, Automatic Weighing, etc. Suitable for Powders, Granular Materials, Pastes, Chemicals, etc., etc.

BEANS	HAIR CREAM	RICE
BICARBONATE	HEADACHE OR	SAGO
BIRD SEEDS	ASPIRIN POWDERS	SEMOLINA
COCOA POWDER	HERBS	SOUPS
COFFEE	INKS	SOUP POWDER
CORNFLOUR	LIQUIDS	STARCH
DISINFECTANTS	MACARONI	STUFFING
DYES	MILK	MIXTURES
EPSOM SALTS	OATMEAL	SUGAR
FACE CREAM	OILS	SYRUPS
FISH PASTE	PAINTS	TAPIOCA
FLOUR	PEAS	TEA
FRUIT JUICE	PELLETS	THICK SAUCES
FURNITURE CREAM	PERFUMES	TONICS
GARDEN SEEDS	PICCALILLI	VINEGAR
GLUCOSE	PASTILLES	WHEAT FLAKES

Etc., Etc.

Speedy. Hygienic. Accurate. Economical.

Send for Leaflets

Sole Selling Agents for the United Kingdom:

W. JAMES DAVIES (ENTERPRISES) LTD.

MAINDY WORKS, NORTH ROAD, CARDIFF

Phone: CARDIFF 7791

Speed with efficiency . .

Where speed with the minimum of handling is essential the 'Wedco' woven wire belt is particularly efficient. Many manufacturers have taken advantage of our Technical Advice Service which is available without obligation. Have we heard from you?

Wedco

WIRE BELTS

THE BRITISH WEDGE WIRE CO.

ACADEMY STREET WARRINGTON Tel No

The EJECTOPUMP (Compressed Air Operated)

is SELF PRIMING & PORTABLE — PUMPS HEAVY VISCOUS, ABRASIVE AND SOLID LADEN LIQUIDS

NO Rotating Parts
NO Packings
NO Glands

EASILY CLEANED

Write for List 708

GRESHAM & CRAVEN LTD
BRITAIN LANE SALFORD MANCHESTER 3
ENGINEERS.
'Phone No.: Deansgate 6661-2-3-4
Telegrams: Brake Phone, Manchester
London Office: 14, GREAT PETER STREET, WESTMINSTER, LONDON, S.W.1

G.E.16

Special invitation
to Readers of
FOOD MANUFACTURE

Your prompt acceptance is urgently requested

SUBJECT to your acceptance, we will send you by return one of the few copies of the first post-war MANUFACTURERS' PRACTICAL RECIPES which we have earmarked exclusively for those readers of FOOD MANUFACTURE who need and can make profitable use of this invaluable Work.

Practical, Tested, Ready-to-Use Recipes for Food Manufacturers

You can put MANUFACTURERS' PRACTICAL RECIPES to profitable use as soon as you receive it; for its "Foodstuffs" Section alone contains no fewer than 366 instantly-usable recipes and processes, scores of which have never been published before. "Flavourings" and "Animal Foods" account for an additional 73.

Here you will find all the latest and most authoritative data, based on laboratory tests, for the manufacture of :

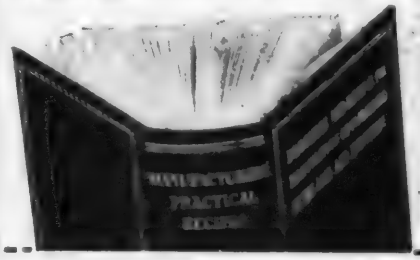
Biscuits; Cooked and Potted Meats; Blancmanges; Mayonnaises; Puddings and Mincemeats; Sausages and Sausage Seasonings; Ice Cream; Jams and Jellies; Pickles; Fruit Concentrates; Soups; Colourings; Spice Mixings; Culinary Oils and Fats; Edible and Essential Oils; Sweets; Toffees; Fondants; Bonbons, and so on.

And these are only a few of the 7,048 formulæ and processes for all kinds of products, that this unique Volume—completely rewritten and brought into line with today's needs—brings you.

For generations, through numerous editions, MANUFACTURERS' PRACTICAL RECIPES has been the acknowledged standard Reference Work of its class, providing a service unparalleled in value, scope and universality of application. It is packed with profitable, business-building ideas — pointers to unexplored markets— new sources of revenue. Many a successful food product has originated here. Whether you want to produce something entirely new or to improve an existing line, it will prove an unfailing source of suggestion; and any one of its recipes, aptly applied, will repay you the modest cost of the complete volume again and again.

Even if you possess an old copy of MANUFACTURERS' PRACTICAL RECIPES you need a copy of the latest edition: it embodies so many revisions and additions as to constitute a virtually new work.

Orders filled in Strict Rotation: send yours NOW



Stocks are selling fast, and this offer holds for a limited period only. Once it is withdrawn it cannot be repeated. To secure the Volume we have earmarked for you please return the coupon at once.

Fill in and Post this Coupon TODAY

SHAW PUBLISHING CO. LTD.
180 Fleet Street, London, E.C. 4

Please send me post free by return one copy of MANUFACTURERS' PRACTICAL RECIPES, for which I enclose deposit of 3s. I agree to complete my purchase by sending you three consecutive monthly payments of 20s. each, commencing on the first of next month, making 63s. in all.

Name..... *Date*.....

Address .....

..... FM/MPRI

Note: If you prefer to purchase the work outright, deduct 10% cash discount and remit only 56/9 in full payment. Overseas orders must be accompanied by full cash, 70/-, including packing and carriage.

THE HIGHLY CONCENTRATED
LIQUID CLEANSER

A few drops of free-lathering TEX FOAM on moistened hands will quickly remove the most obstinate dirt and grease. The detergent properties of TEX FOAM clean harmlessly, thoroughly and easily any substance, fabric or surface. Its uses as an industrial cleanser are almost limitless. TEX FOAM is economical, and is free of coupons and permits. Write for a sample and literature, or ask for a representative to demonstrate in your own works. No obligation, of course.

DURAZONE COMPANY LIMITED (Bulk Sales Dept.)
59-60, Old Bailey, London, E.C.4. (Tele: City 1058-9)

TEX IS A DURAZONE PRODUCT

Festive Flavours and Essences

THE GLYNN COMPANY LIMITED
GLOBE WORKS · HALIFAX · YORKSHIRE
London: 2 Lonsdale Rd., Kilburn, N.W.6 Edinburgh: 8 Claremont Gardens, Leith

The Graiseley IN ACTION!

A complete answer to internal transport problems. Pedestrian controlled Electric Vehicle. Simple control with low running costs.

Price of the Graiseley complete with Batteries, Reversing Switch, Metal Rectifier Charger and Platform body: £210 ex-works.

You will find much of interest in our new Catalogue, with illustrations of the Graiseley in many industries.

Mention this journal when writing for catalogue.

DIAMOND MOTORS (Wolverhampton) LTD
Upper Villiers Street · WOLVERHAMPTON
Telegrams: Graiselect Telephone: 22931

'Besco'
Semi-automatic
Double Seaming
Machine
Size 12

DELIVERY FROM STOCK

Arranged with hand feed for round cans. The cans revolve. Capacity is from 1½ in. to 6½ in. diameter . . . from ¼ in. to 17 in. high. Output 40 to 45 per minute.

F. J. EDWARDS LTD.
359-61 EUSTON ROAD
LONDON, N.W.1
Telephone: EUSTON 4681-3771
Telegrams: BESCOTOOLS, NORWEST, LONDON

★ SAVE FUEL AND STILL GET PLENTY OF HOT WATER

THANKS TO A

Leonard-Thermostatic

MIXING VALVE

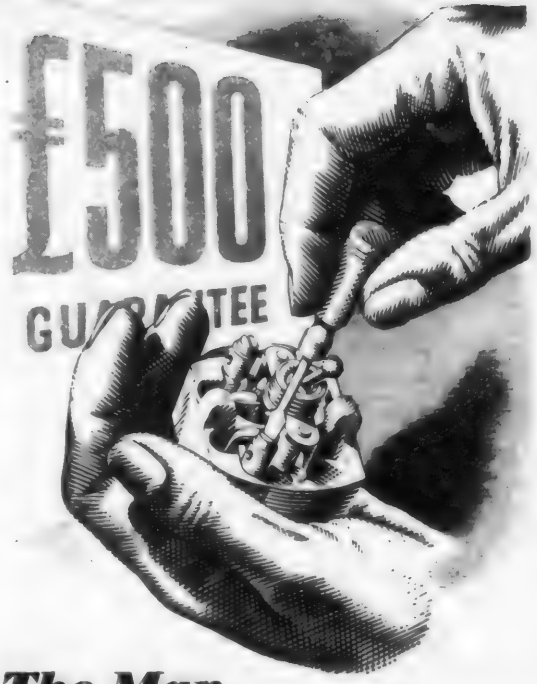
(PATENTED)

A Leonard-Thermostatic Steam and Water mixer provides hot water at controlled temperature for washing and process. The hot water is made only where it is wanted and when it is wanted. That is where the saving comes in. Storage often takes more heat than use. Expensive equipment hard to get and costly to buy is avoided. Automatic control keeps the temperature steady in spite of fluctuations. Thousands are in daily use for process work and ablutions in

Textile Mills • Food Factories • Chemical Factories
Tanneries • Dairies • Laundries • Paper Mills
and a host of other Industrial, Commercial and Government users.

PLEASE WRITE FOR FULL DETAILS QUOTING REF. 20/1881

WALKER, CROSWELLER & CO. LTD
WHADDON WORKS
CHELTENHAM, GLOS., ENGLAND



The Man with the £500 hands

Why so valuable? They are the hands of a highly skilled electrician who takes pride in his work. He is typical of thousands of reliable technicians employed all over the country by members of the Electrical Contractors Association. The confidence shown by both Employer and the Association in maintaining this high standard is reflected in the clear-cut guarantee of £500, offered in conjunction with the N.E.C.T.A., against faulty materials and workmanship which every contract carries. From the simple fitting of a lamp to the most complicated wiring specification your best interests will be served by calling in a member of the E.C.A.

N.B.

HORTON'S

CLEANSING WAY

HAS A NEW STAR

macol

Hortons stake their reputation on the efficiency of MACOL CLEANSING POWDER for use in food factories. A sample gladly sent to prove that MACOL:—

- Is highly concentrated (put 1 oz. to 1 gall.)
- Contains no Caustics or Abrasives
- Produces Rich Lather and an Active Solution
- Efficient in Hard or Soft Water

USE FOR CLEANING: *PANS—MACHINERY—CROCKERY—AND ALL GENERAL PURPOSES.*

PROMPT DELIVERY • RATION FREE

Write for pamphlet giving full particulars of all HOMACOL products to :

THE HORTON MANUFACTURING CO., LTD.,
'HOMACOL' WORKS, RICKMANSWORTH, HERTS.
TELEPHONE: RICKMANSWORTH 3161
TELEGRAMS: LIQUISOPA RICKMANSWORTH

S.1

AUTOMATIC
FILLI
The most complete range of Automatic Weighing, Screw Filling and Volume Filling Machinery for Teas, Cereals, Flour, Face Powders, Medicinal Powders, or any powdered or granulated material packed in Bags, Cartons, Tins, Bottles, etc
Completely Automatic Plant for Bag & Envelope Filling & Sealing.
Full Range Automatic Ampoule Laboratory Equipment, Filling & Sealing Liquids or
Automatic Weighing & Packing Machine Co.
Proprietor: Arthur R. Smith
22, Caroline Street
Birmingham 3

GUM TRAGACANTH
GUM KARAYA
GUM ARABIC

In Flake, Lump or Powder.
For samples & prices apply stating requirements to:

HILTON, WALLACE
& CO. LTD.
St. Dunstan's House,
Idol Lane, E.C.3.
Tel.: Mansion House 1005

INSURE WITH

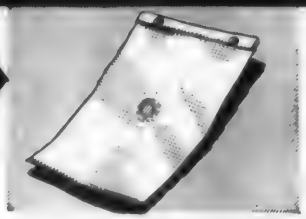
THE LONDON & LANCASHIRE INSURANCE Co. LTD.

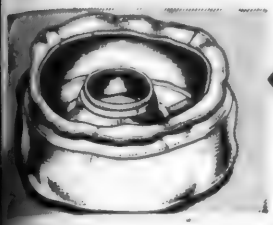
For Prospectus, and full information on all classes of Insurance, write to :

Chief Administration :
7, Chancery Lane, London, W.C.2

ILTER CLOTHS

Size and type as required. Materials for all purposes.



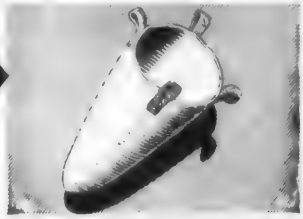


SPINNER BAGS

for Centrifuge filtration. Sizes and materials as required.

CONE SHAPED FILTER BAGS

In Felt, Flannel and other materials.



INDUSTRIAL APRONS

"VYNIDE" PLASTIC COATED

Exceptional wearing qualities. Will withstand constant flexing and folding. Will not crack with cold or exude oil with heat. Coating is fireproof. Coating resistant to action of petrol, oil, grease and dilute acid, but not to strong acids such as sulphuric and nitric. It can be readily washed and cleaned in the same manner as leather cloths.

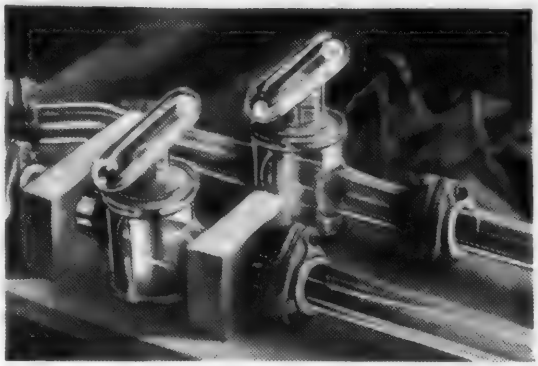
RUBBER-FACED MATERIAL. Resistant to petrol and mild acids.

RUBBER SHEETING. Hard wearing for general purposes.

FILTER BAGS of every type made to your own requirements.

STOCKINETTE ROLLS
INDUSTRIAL GLOVES
COTTON BAGS
CLEANING MATERIALS
TEXTILE COVERS FOR INDUSTRIAL PURPOSES

The *Futurist*
SOFT FURNISHING COMPANY LIMITED
ROCKWOOD WORKS, BROADGREEN RD., LIVERPOOL 13
Telephone: Stoneycroft 2761



PYREX

Registered Trade Mark Brand

GLASS PIPE LINES

Reduced Prices and A New Range

MESSRS. JAMES A. JOBLING & CO. LTD., WEAR GLASS WORKS, SUNDERLAND, have pleasure in making the following two announcements :

Reduced Prices for PYREX Brand Glass Pipe Lines

DUE to improved production methods and increasing use of PYREX Brand Glass Pipe Lines, a new price list showing substantial price reductions came into operation on November 1st, 1948.

New Range of PYREX Brand Glass Pipe Lines

A new and complete range of PYREX Brand Glass Pipelines in ⅜-inch bore is now available. This line has been developed for use where our normal 1-inch bore is too large, and will meet the needs of those who require a smaller pipeline which will handle chemicals, foodstuffs and beverages by the most hygienic, contamination-free and up-to-date method.

Please write for full details of this simple-to-erect piping system, which is made from our famous PYREX Brand Borosilicate Glass.

James A. Jobling & Co. Ltd., Dept. 13, Wear Glass Works, SUNDERLAND.

TIP-TOP QUALITY

SWEETENED FAT

FRUIT SYRUPS

Sweet Almond Oil

Glyceryl Monostearate

Bakers' Sundries

Teaseed Oil

Lactose

SEND YOUR ENQUIRIES TO

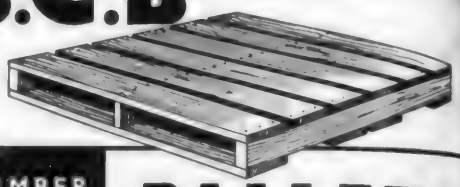
STEEL & GENERAL LTD.

44, BOW LANE, LONDON, E.C.3

Telephone : CITy 2556/5540

Folk who know use

B.C.B AIR-DRIED HARDWOOD



TIMBER PALLETS ARE USED BY 90% OF USERS IN U S A

PALLETS

WITH ALL THE ADVANTAGES

Palletization has come to stay as the most economical method of handling merchandise with enormous potentialities for cost saving. But when palletizing, start with the right pallets. Let us advise you. B.C.B. Hardwood pallets—fastened with Helyx Drive Screw Nails—are best of all timber pallets. Write for particulars.

- Less initial capital outlay.
- Rigid two-way construction.
- Lightest, strongest, most durable.
- Load does not slip when cornering.
- Ideal for food and chemical stores.
- Available in several different types to suit all requirements.

B.C.B. PALLET CO. LTD., 66 GLOUCESTER PLACE, LONDON, W.1

Phone: WELbeck 5080

WORKS ADDRESS : BIRCHILL ROAD, KIRKBY, LIVERPOOL

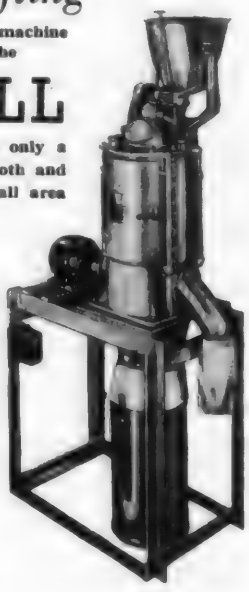
BCB

high speed sifting

means more output and the machine that will do this for you is the

PASCALL

Turbine Sifter which uses only a small amount of screen cloth and which takes up only a small area of factory floor space.



Let us demonstrate to you the advantages of turbine sifting. A practical test on your own material at our London Test Station will show you why leading manufacturers prefer this method of sifting.

Write for list
FM 1248

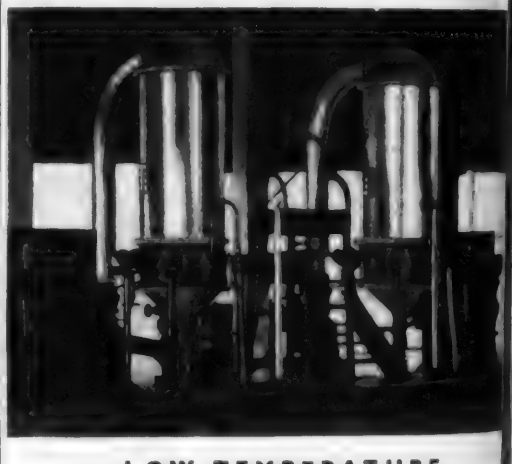
THE PASCALL ENGINEERING CO. LTD.

MANUFACTURERS OF GRINDING, SIFTING AND PIPING MACHINERY

114 LISSON GROVE LONDON N.W.1

TELEPHONE, PADDINGTON 7236 TELEGRAMS, PASENCO PHONE LONDON

LEMALE



LOW TEMPERATURE CONCENTRATING PLANT

FOR DELICATE PRODUCTS

DELIVERY 3-4 MONTHS

MACHINERY (Continental) LTD.

70 VICTORIA STREET, LONDON, S.W.1

Telephone : VICTORIA 6147 **Cables : MACCONTAL, LONDON**

A leading London Store puts its boilerhouse on the roof!

★ *Two B & A Electrode Boilers each providing 750 lbs. steam/hr. for cooking meats.*

An Electrode Steam Boiler occupies less space and is more convenient to house than any other source of steam supply of equal rating. It needs no chimney, no fuel store, no boilerhouse, no attendant. It can be put alongside the plant using the steam, saving steam losses and the cost of lengthy steam runs.

Maximum output is obtained from cold within 5 minutes of starting up. When steam is not needed it can be shut down immediately. B & A Boilers are fully automatic, the load is closely controlled by the steam demand, no power can be wasted. They are being used in every branch of industry. For full details write for List No. 30.

ELECTRODE BOILERS

BASTIAN and ALLEN, Limited
11 BEDFORD SQUARE • LONDON • W.C.1
Northern Office: 62 Robertson Street, Glasgow, C.2

CANNON

Acid resisting Glasslined

PLANT

Firing the glass lining of a **1000-gallon** mixing pan. The purity of your product depends on perfect plant.

CANNON IRON FOUNDRIES LTD.
DEEPFIELDS, BILSTON, STAFFS.

The Amazing SIX-PURPOSE

SILVERSON

BRIT. PATENT NO 581,448

Bronze Medal Award
Dairy Show, London
1948

(1) MIXES COMPLETELY
(2) EMULSIFIES TO PERFECTION
(3) HOMOGENISES CORRECTLY
(4) CONTROLS AERATION
(5) STRAINS
(6) PUMPS

CAN BE USED IN ANY VAT FOR ALL TYPES OF MIXES
IN 4 SIZES UP TO 100 GALLONS
PRICES FROM £55
QUICK DELIVERY

Send for illustrated brochure

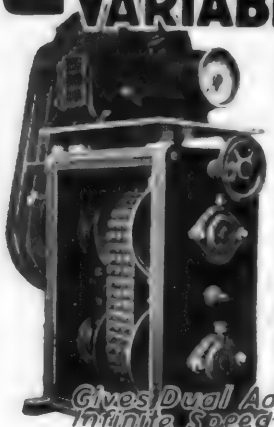
SILVERSON MACHINES (SALES) LTD.
11-12, FINSBURY SQUARE, LONDON, E.C.2
Telephone : MONARCH 5642-3

Step in now!

Poster displays in Sheldons' Yorkshire and Lancashire towns today afford Advertisers an exceptional opportunity.
A number of specially coveted positions have become available.
For Advertisers wishing to launch a trial campaign Sheldons can print and supply posters produced by their own "Essellprint" Silk Screen process.

Sheldons Ltd
Established 1840
SHELDON HOUSE, QUEEN ST., LEEDS, 1

CROFTS VARIABLE SPEED DRIVES



Standardised V/S Gears (as illustrated); also Patented V/S Pulley Drives (to fit on Motor or Driving Shaft) for all general requirements.

UNIVERSAL APPLICATION
ABSOLUTE RELIABILITY
THOUSANDS IN USE ON ALL CLASSES OF MACHINES

Gives Dual Advantage of Infinite Speed Variation & Speed Reduction or Increase

STANDARDISED FOR POWERS UP TO 60 H.P. AND FOR ALL SPEED RATIOS UP TO 40 to 1
For particulars ask for catalogues VG.835.V.P.338

CROFTS (ENGINEERS) LTD
THORNBURY - BRADFORD - ENGLAND
LARGEST MAKERS OF VARIABLE SPEED DRIVES IN EUROPE

Smarten your Staff wi

Stamana

OVERALLS

Write for details of the Stamana fully-shrunk range to S.W. & W.E. STANDARD MFG. CO., Ltd., Bute St., Cardiff.

Smartness pleases your custom and increases the self-respect a efficiency of your staff. Stam smartly cut and long-wearing ove are made for all grades. The still handicapped we shall make a effort to meet your require

"RED BALL BRAND"

Essences Colours

For the Soft Drinks Industry, Confectionery and the Food Manufacturing Industries

STEVENSON & HOWELL LIMITED

Standard Works, Southwark Street, London, S.E.1. Telephone: Waterloo 4833 (8 lines). Established 1882. Telegrams: "Distiller, Phone, London."

SERVICE TO INDUSTRY—7

Do you know that British Railways provide an industrial information service to assist manufacturers in deciding on sites for new works?

From this service you can obtain details of available factory premises and sites, with information about the public utility and other services, the nature of the soils, where to obtain the raw materials and how to market the products.

Our Regional Commercial Officers will be happy to place this service at your disposal, of course without charge.

BRITISH RAILWAYS

BRITANNIA
FOLDING BOX
COMPANY LTD

FOLDING BOXES OF
EVERY DESCRIPTION

**CARTONS
DISPLAY BOXES
FOR PROTECTION &
PUBLICITY**

LITHOGRAPHIC AND LETTERPRESS PRINTERS

Telephone
ADMIRAL 3261
(4 lines)

BFB

Telegrams & Cables
ENUMERATE
BOXMATCH LONDON

60 years' experience at your service

DACE ROAD, OLD FORD, LONDON, E.3

**STEAM
& GREASE TRAPS**

For pressures up to 10 lbs./□". Specially designed to prevent hot grease from passing into drains. Extensively used in connection with Steaming Vessels, Cooking Apparatus, etc.

Particulars given on request.

BRITISH STEAM SPECIALTIES LTD., LEICESTER

LONDON LIVERPOOL • WHISTON • GLASGOW • BIRMINGHAM
MANCHESTER AND NEWCASTLE-ON-TYNE

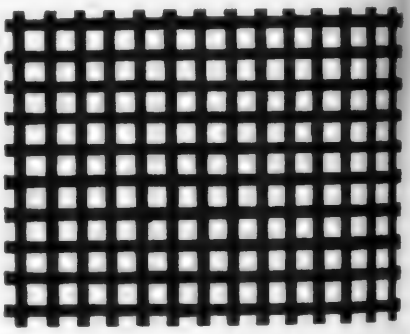
Bacterase
*

An enzyme for the liquefaction and conversion of starch

★ *Write for full descriptive literature. Our technical experts are always ready to help.*

NORMAN EVANS & RAIS LTD.
DUDLEY ROAD ★ MANCHESTER 16
Telephone: MOSs Side 2277 (2 Lines). Telegrams: Chrievan, Manchester

**STAINLESS STEEL
WIRE GAUZE**



IN ALL MESHES
FOR ALL FOOD PURPOSES

WM. RIDDELL, COUSLAND & CO. LTD.
SPRINGFIELD WIRE WORKS
GLASGOW S.E.

Leaders
in the Food Industry

insist on

"MONOCOL"

(BRAND)

GLYCERYL MONOSTEARATE

Samples and quotations
from

CHEMICALS & ESSENTIAL OILS LTD.

SARDINIA HOUSE, KINGSWAY, LONDON, W.C.2

Telephone: CHAncery 6116/8. Telegrams: CHEMOILS, ESTRAND, LONDON.

All Colours for Foodstuffs

TARTRAZOL YELLOW

(Synonymous with Tartrazine)

Probably the most widely used of all the edible colours and prominent in our extensive range. The quality manufactured by us is unsurpassed for purity and is, of course, fully guaranteed to be in strict conformity with the Food Laws of this country. It is also on the 'permitted list' of most other countries in the world.

We invite you to send us your enquiries not only for the above but for all foodstuff colours and if you have any colour problems confronting you we shall be glad to help you.

Williams HOUNSLOW Ltd.

MANUFACTURERS OF EDIBLE COLOURS SINCE 1877

HOUNSLOW MIDDLESEX

PATTINSONS
CEREAL FOODS

CEREAL FILLERS

If you are using cereal products as fillers or would like to consider the use of these you are invited to write to :—

JOHN PATTINSON & SON LTD

BEACON MILLS,
WHITEHAVEN, CUMBERLAND

Manufacturers of Oat and Barley cereal products.

All enquiries are regarded as confidential and enquiries for specialised products for particular purposes will receive special attention.

Designed by Specialists

ADELPHI AUTOFILLER

is one example of our range of Precision Equipment

Let it solve your Bottle Filling Problem

- Hand Operated Gravity Fed
- Simple Construction
- Non-Corrodible
- Positive Action
- Rapid Filling
- Wide Range of Nozzles
- Container holds 4 gallons

PROMPT DELIVERY

Adelphi Manufacturing Co. Ltd.
(Dept. A3)
393A, CITY ROAD, LONDON, E.C.1

THE BOFOX MIXING MACHINE

10 & 20 QUART SIZES
THE ALL-PURPOSE MIXING MACHINE

General Features:

Robust Construction.

3-Speed Gear Box.

Single Lever Control Starting.

Synchronised switch control automatically governing Motor Drive between Gear changes.

Streamlined Vibration-proof cast body. Mechanism and Driving Motors totally enclosed.

Facilities for attachment drive incorporated.

Dimensions :

Height 25 ins.
Length 21 ins.
Width 17 ins.
Weight 150 lbs.

MOTORS TO SUIT ANY CURRENT SUPPLIES.

Enquiries invited for Fish Frying Ranges and Milk Bar Counters and Fitments.

A.G.M.&Co.Ltd. FULWOOD HOUSE FULWOOD PLACE
HIGH HOLBORN, W.C.1 HOL: 6900 (10 lines)

GUMS & RESINS

ACACIA
BENZOIN
DAMAR
MANILA
KARAYA
SANDARAC
SHELLAC
TRAGACANTH

DIRECT IMPORTERS:

M. HAMBURGER & SONS

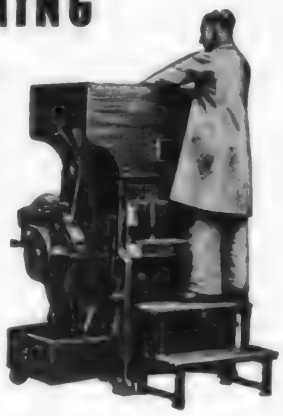
Telephone :
MANsion House 4405
(3 lines)

Telegrams :
Homacion Bilgate
London

CEYLON HOUSE
EASTCHEAP
LONDON, E.C.3

DRY CLEANING

is a modern method designed for extracting dirt and foreign matter and at the same time leaving the article in its ***original*** form and retaining its ***entire*** properties.



● *50 years of experience in cleaning CURRANTS and SULTANAS is placed at your service. We have a machine for all classes of manufacturers. Write for our illustrated catalogue.*

This is exactly what the

DUCKWORTH DRY FRUIT CLEANER

does.

It takes from **Currants** and **Sultanas** the STALKS, DIRT, DUST GRUBS and NAILS leaving the fruit with its ***original*** bloom and its ***entire*** sweetness.

CALEB DUCKWORTH LIMITED · COLNE · LANCASHIRE

Steam Pans in Stainless Steel

ANY CAPACITY

BOTH STATIONARY AND TILTING TYPES

Enquiries to :

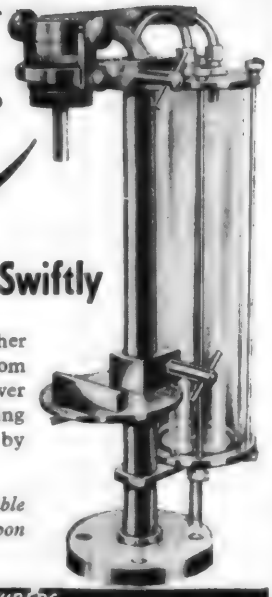
BURNETT & ROLFE LTD.

THE ESPLANADE, ROCHESTER

Phone: Chatham 3861 Grams: Fullyquip, Rochester

VACFILL
TRADE MARK

Fill it by 'Vacfill'



Simply... Cleanly... Swiftly

For filling bottles, tins and other containers with liquid foods from vinegar to thick sauces, the answer is the "VACFILL" Vacuum Filling Machine, efficiently operated by the unskilled.

The Single Head Model is available for early delivery. Full details upon request.

MANUFACTURERS

BUSBY, WINTER & Co. LTD.

VACFILL WORKS, 9-11 ANDOVER PLACE, LONDON, N.W.6.

TEL.: MAIDA VALE 2867 & 5901. CABLES: VACFILL LONDON.

TAYLOR 2084

Adhesives

MANUFACTURERS OF VEGETABLE GUMS AND PASTES FOR

ALL TYPES OF FOOD PACKING BOTTLING & LABELLING MACHINES

•

Free samples on application

•

W. C. HALLS & CO. LTD.

NEWARK-ON-TRENT

Established 1887 *Tel.: Newark 100*

DIACETYL

ACETYL METHYL CARBINOL

Refined products for stimulating butter-flavour and odour in manufactured foods, beverages, confectionery, etc. Also for use in essences and perfumes.

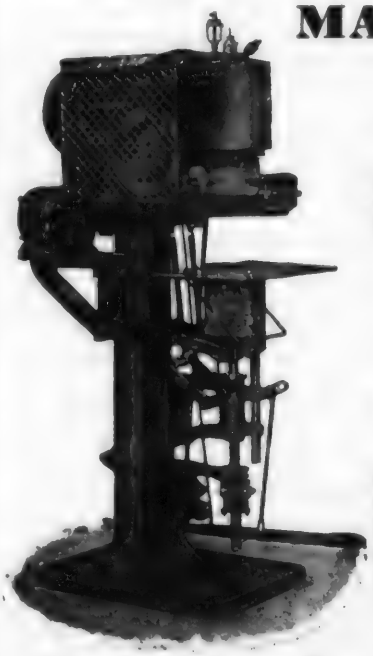
Please address inquiries to

ADVITA LIMITED

2 KINGSCOTE STREET, LONDON, E.C.4

TPDA-5

The ***COMPLETE*** **CANNING MACHINE**



VACUUM SEAMERS do The Whole Job

NO Exhausters Piercing Pre-Heating

•

Half-Automatic TYPE BS/4 closes 20 cans a minute with stationary can, four roller, patent automatic seaming head.

•

The PREMIER FILTERPRESS Co. Ltd.

GROSVENOR CHAMBERS, WALLINGTON, SURREY

TELEPHONE: WALLINGTON 5572/3

"quite as good nylon in the sea . . ."

Nylon yarn wet has nearly as many uses as nylon yarn dry, thanks to its properties of low moisture pick-up, high wet-strength, toughness and abrasion-resistance under all conditions. So nylon makes hawsers and nets for the fishing fleet, filter cloths and bolting cloths for the food and chemical industries. Canvases and protective clothing are two more items on the nylon list . . . B.N.S. and your textile supplier are open to enquiry about others.

Think round the properties of *Nylon* the yarn that's a 'natural' for Industry

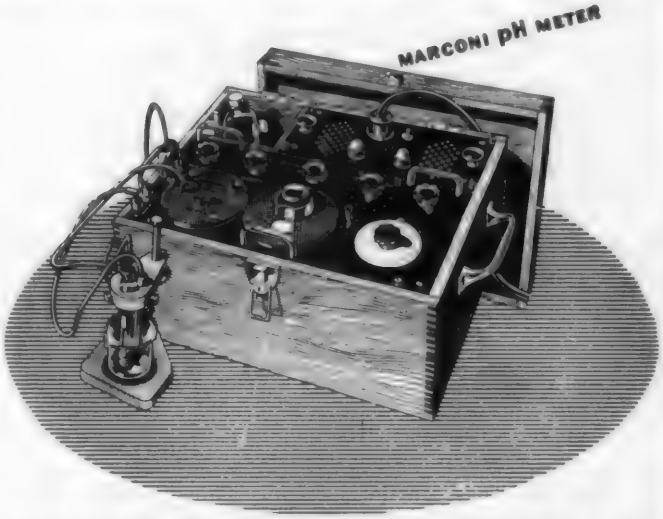
High strength—light weight
Toughness—durability
Elasticity—flexibility
Low moisture absorption and high wet-strength
Quick drying—easy cleaning
Resistance to deterioration by mildew, petroleum oils, alkalis and soil rot
Resistance to attack by moths and other insects
Flame proof. i.e. does not propagate combustion

B Nylon S

British Nylon Spinners Limited, Pontypool, Monmouthshire.
All enquiries to Technical Service Section, British Nylon Spinners Limited, Lockhurst Lane, Coventry.

pH — THE SIGNIFICANT FACTOR

That pH is a significant factor in chemical change is now widely realised; the importance of pH measurement cannot therefore be over-estimated, wherever aqueous solutions are involved. Fortunately, however, the most accurate method is also the simplest, for a Marconi pH METER will register correctly to 0.02 pH, yet can be used without difficulty by even unskilled personnel. Either mains or battery operated, the pH METERS utilise the glass electrode and are designed for "spot" tests in works or laboratory. Marconi's vast experience of electronics ensures both technical and operational reliability. Write for full particulars.



MARCONI (M/I) **INSTRUMENTS LTD.**

MEASUREMENT FOR INDUSTRY

ST. ALBANS, HERTFORDSHIRE | Phone: St. Albans 6161/5

Northern Office: 30, ALBION STREET, HULL. Phone: Hull 16144.
LONDON, S.W.1. Phone: SLOane 8615. Western Office: 10, PORTVIEW ROAD, AVONMOUTH, BRISTOL. Phone: Avonmouth 438
Southern Office & Showrooms: 109, EATON SQUARE.

WINGET-DOLE

VACUUM COLD PLATE EVAPORATORS

(MANUFACTURED BY WINGET LTD. OF ROCHESTER KENT)

for natural gravity air cooling.

Also many other applications

WINGET-DOLE Overhead Plate Banks installed by Frigidaire in the quick-frozen food store of Tarver & Sidwell Ltd., Leamington Spa.

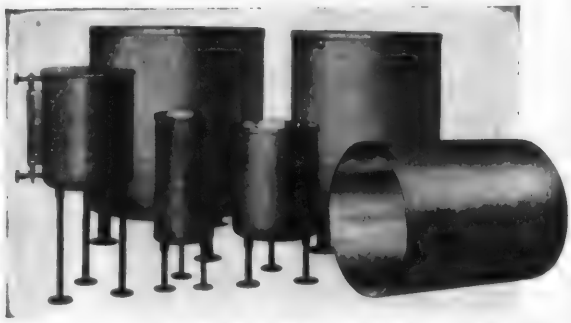
Enquiries to

WINGET Ltd

Winget House, 24 Grosvenor Gardens, London, S.W.1

HYGIENIC

EQUIPMENT



IN STAINLESS STEEL

The containers illustrated are typical of the non-corrosive, hygienic and easily cleaned equipment made by us for the Food Industry.

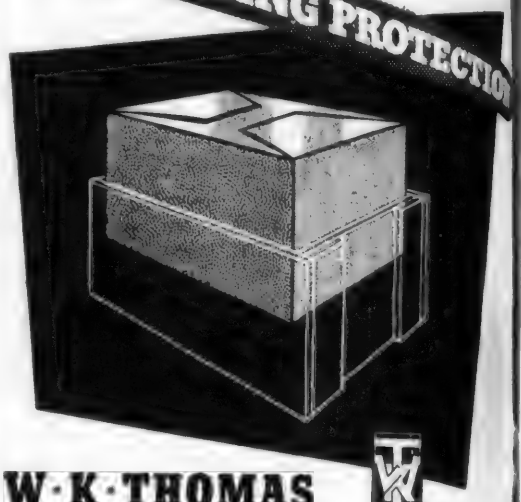
Fitments of all kinds, containers, utensils, etc., made to requirements in light or heavy gauge "STAYBRITE" STAINLESS STEEL, MONEL METAL, COPPER OR STEEL

Maitlands (Metal Works) Ltd
EASTVALE PLACE. GLASGOW, C.3

---

against moisture, d
and contaminatio

PACKAGING PROTECTIO



W·K·THOMAS AND COMPANY

27 JOHN ADAM ST., ADELPHI, W.C.
Telephone: Temple Bar 6204
Telegrams: Plysack, Rand, Londo

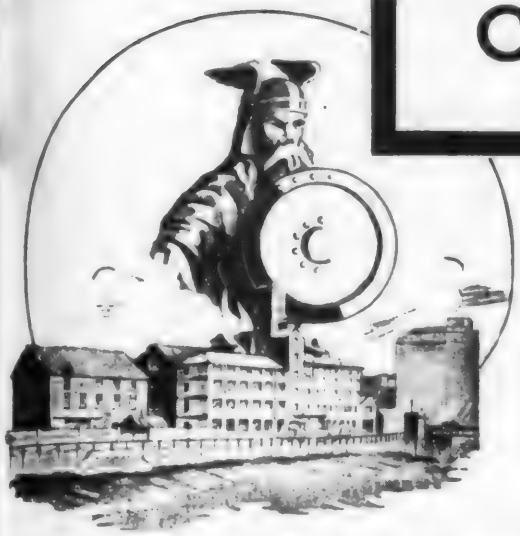
ANGLO-IRANIAN OIL CO. LTD. ASHDOWNS LTD. W. & T. AVERY LTD. BONDOR LTD. BRITISH TYRE & RUBBER CO. LTD. BRITISH THOMSON-HOUSTON CO. LTD. BUSH RADIO LTD. BORG & BECK CO. LTD. CASELLA LTD. CHANCE BROS. LTD. CRESSBROUGH MANUFACTURING CO. LTD. C. & J. CLARK LTD. CREMO-PLASTICS LTD. CO-OPERATIVE WHOLESALE SOCIETY LTD. DRUGS LTD. ELEXCEL LTD. ENFIELD CLOCK CO. (LONDON) LTD. FRIGIDAIRE LTD. GENERAL ELECTRIC CO. LTD. HALEX LTD. JURY HOLLOWARE (STEVENS) LTD. CYRIL JUPP & CO LTD. KOLYNOS (SALES) LTD.

THESE FAMOUS FIRMS HAVE PLACED REPEAT ORDERS FOR

The FLOWLINE CONVEYOR SYSTEM

CHRISTOPHER LENG & SONS LTD. LEVER BROS. & UNILEVER LTD. LEYLAND & BIRMINGHAM RUBBER CO. LTD. LINES BROS. LTD. LUCASEED WIPERS BRAKE CO. LTD. McMICHAEL RADIO LTD. MARLEY TILE CO. LTD. MAYNARDS LTD. MESSRS. LTD. J. & G. MEAKIN LTD. NORTHAM WARREN LTD. JOSIAH PARKES & SONS LTD. C. H. PARSONS LTD. PEDIGREE CO. LTD. J. A. PHILLIPS & CO. LTD. PHILIPS HAMILTON WORKS LTD. J. SAINSBURY LTD. SALFORD ELECTRICAL INSTRUMENTS LTD. G. H. SCHOLES & CO. LTD. SCOTT & TURNER LTD. SIMMONDS AEROCESSORIES LTD. SIMPLEX ELECTRIC CO. LTD. STANDARD MOTOR CO. LTD. STEVENS & WILLIAMS LTD. CHARLES TYRER & CO. LTD. UNIVERSAL METAL PRODUCTS LTD. VACTRIC LTD. JOSIAH WEDGWOOD & SONS LTD. WHISTLE PRODUCTS LTD.

For 32-page Handbook describing this revolutionary step forward in Mechanical Handling, write to the General Manager, Fisher & Ludlow, Ltd., Dept. No. 7, Gridway Division, Rolfe Street, Smethwick. Telephone SMEthwick 2061.



CHIEFTAIN
YEAST PRODUCTS

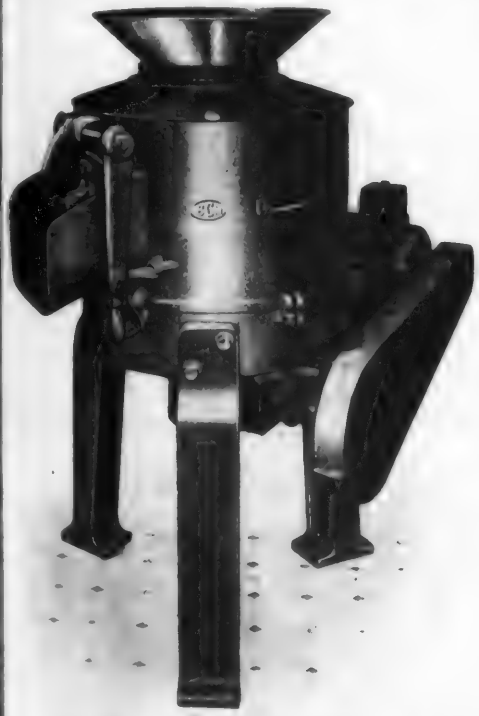
BAKERS' YEAST
YEAST EXTRACTS
DRIED YEAST
ERGOSTEROL
CALCIFEROL
(VITAMIN D2)

BRITISH FERMENTATION PRODUCTS LTD.

HEAD OFFICE: 46 PUTNEY HILL
LONDON, S.W.15 Phone Putney 2586

FACTORIES: Chieftain Works, Wolsey St. & Stoke Tower, Ipswich
CHIEFTAIN WORKS, PUTNEY, LONDON, S.W.15 Tel. PUT 5774

DEPOTS IN ALL PARTS OF THE COUNTRY



Fruit and Vegetable Snibbing and Peeling Machine

Latest Machinery
FOR
FOOD PROCESSING
FRUIT PRESERVING
CONFECTIONERY
MANUFACTURE, ETC.

CONSULT BCH

WM. BRIERLEY, COLLIER & HARTLEY LTD.
BORO WORKS, ROCHDALE. Telephone: 4181

LONDON OFFICE:
SUNRIDGE, RUDEN WAY, EPSOM DOWNS, SURREY
Telephone: Burgh Heath 2749

Established 1835

LARGEST JAM AND CONFECTIONERS' MACHINISTS IN THE TRADE

FOOD CARTONS

Attractive, hygienic, convenient – and not expensive – cartons are the ideal food pack.

We shall be pleased to quote for supplies you are at present using and for new designs.

BOXFOLDIA LTD.
CARTON MANUFACTURERS
BOURNBROOK, BIRMINGHAM

STOP WATCHES

FOR TIME AND MOTION STUDY ETC.

For time and motion study, process control, production timing, and for a host of other occasions, a Stop Watch can give invaluable aid, but it must be accurate to a fine degree. For over a century and a half, Camerer Cuss have been renowned for accurate timekeepers of all kinds. Their name is your guarantee of Stop Watch accuracy.
Stop Watches can be supplied in several standard patterns and also calibrated for special purposes. All our Stop Watches are backed by a comprehensive repair service. Let us know your requirements—and we will supply just the Stop Watch you need.

At Camerer Cuss you will find some very good clocks as well as watches for pocket or wrist. Call and inspect our selection.

CAMERER CUSS
Makers of Good Clocks & Watches since 1788
NEW OXFORD STREET · LONDON · W.C.1
Also 91 Kingsway, W.C.2

'EMULSOL'

GLYCERYL-MONOSTEARATE
Self-Emulsifying Block and Powder

PROMPT AND REGULAR DELIVERIES

GUARANTEED
FINEST FOOD & DRUG QUALITY

'EMULSOL' No. 1 has a phenomenally low acid value with a high emulsification ratio and a fine fluid texture. Pure white—completely tasteless and odourless in use—produces a substantial over-run. The ideal fat-extending emulsifying agent for cake batters, ice cream mixtures, tin greasing emulsions, etc.

'EMULSOL' No. 2 is supplied to meet the demands of food manufacturers who prefer a Block form. Pure white in colour, and of a good hardness and smooth texture.

SAMPLES AND TECHNICAL DATA SUPPLIED ON REQUEST

Also a full range of
EMULSIFIERS & FAT EXTENDERS

D. S. WOOD (Chemicals) LIMITED
34, BAKER STREET, LONDON, W.1
Phone: WELbeck 6842 Cables: Eswood London
Telegrams: Eswood Wesdo London

Yeastrel

BREWERS' YEAST EXTRACT

Rich in Vitamins B, is highly concentrated and has a low salt content. It imparts flavour and nutritive elements to processed foods.

Yeastrel

BREWERS FOODS SUPPLY COMPANY LTD.
189-191, FOUNTAINBRIDGE, EDINBURGH, 3

FOR

LIQUID FOOD PROCESSING PLANT

GLUCOSE INSTALLATIONS

TANKS · PIPELINES · FLOW METERS

LET

MONTAGUE SHARPE & CO. LTD.

ST. JOHN'S HOUSE · MINORIES · E.C.3

Telephone: ROYAL 1776

offer you the benefit of their many years' experience of Supply and Installation

LOOSE LEAF CATALOGUE WILL BE SENT UPON REQUEST!

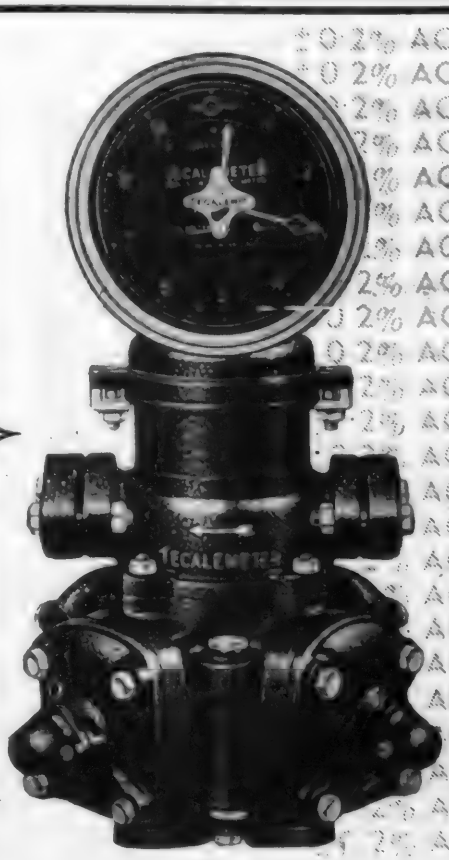
HE
ECALEMETER
OR ACCURATE
ETERING OF EDIBLE
ILS AND SYRUPS.

Invaluable for use with Storage and Blending Tanks, and for Mixing Vessels.

If necessary all parts of the TECALEMETER which come into contact with fluid can be constructed from stainless steel. The TECALEMETER gives readings within ±0.2% accuracy.

Our Drawing Office will willingly prepare TECALEMETER installations, layouts and specifications without obligation.

ALEMIT LTD.—METER AND FUEL HANDLING DEPT.
GREAT WEST RD., BRENTFORD, MIDDX.
Hydraulic & Mechanical, Designing & Manufacturing Engineers
'Phone: EALing 6661 (16 lines)

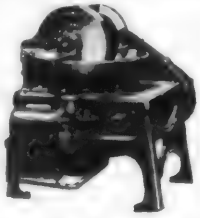


±0.2% ACCURACY

With over **100 YEARS'** *experience*

IN THE MANUFACTURE OF

CHOPPING & FILLING MACHINES



WE OFFER

OPEN BOWL TYPE CHOPPERS

made in six sizes, 12 to 120 lb. capacity.

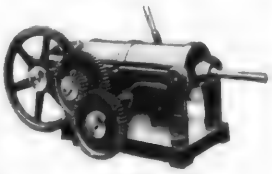
These Machines will cut and mix Sausage Meat in 2½ minutes or Pie Meat in 1½ minutes.

MEAT • FISH • VEGETABLES

AND OTHER COMMODITIES CHOPPED TO ANY DEGREE OF FINENESS WITH MAXIMUM EFFICIENCY

SEVEN TYPES OF FILLERS

Horizontal and Vertical Hand and Power Operated. 12 to 70 lb. capacity which can be adapted to suit special requirements.



All Filling Machines are now supplied with Stainless Steel Nozzles.

Send for fully illustrated catalogue to

JOHN GARDNER & SON

BRADFORD STREET, BIRMINGHAM

The firm with over 100 years' experience in the manufacture of Sausage Making Machinery.

BEAR BRAND HONEY

noted for

Purity & Quality

As direct importers from all the main Honey-producing Countries of the World, we can supply Standard Grades of the finest honey for Manufacturing purposes.

L. GARVIN & CO. LTD.

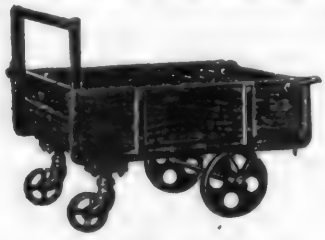
ISLEWORTH

MIDDLESEX

TYNE TRUCK & TROLLEY CO. LTD

66/68 NORTHUMBERLAND STREET — NEWCASTLE UPON TYNE 1

HAND-TRUCKS OF EVERY DESCRIPTION



Platform Box and Turntable Trucks

Sack, Case and Barrel Trucks

Two and four-wheeled Handcarts

"Weasel" Lifting Trucks + Platforms

Wheelbarrows Wheels and Castors

Designed for the job!

AGRIPPA ADHESIVES & DEXTRINES

★ COLD WATER GUM & GLUE POWDERS

★ LIQUID GUMS & GLUES

★ HOT & COLD WATER PASTE POWDERS

★ MAIZE, FARINA & TAPIOCA DEXTRINES

Our range of qualities is extensive and calculated to meet the special requirements of every trade.

AGRIPPA

THE KING OF ADHESIVES

THE FECULOSE COMPANY

GLENFIELD STARCH WORKS, PAISLEY

Phone: PAISLEY 2255-7

London Office:

125 - 130, STRAND, LONDON, W.C. 2

SATINEX

A PURE BURNT SUGAR CARAMEL WHICH IS MADE ESPECIALLY TO MEET THE REQUIREMENTS OF THE BAKERY & CONFECTIONERY TRADES

SATINEX can be used for the colouring of biscuits, cakes, chocolate rolls, mincemeats, puddings, liquorice sweetmeats, toffees, and all types of foodstuffs. Satinex imparts a delightfully rich and appetising appearance, thus enhancing the SALES value of the goods in which it is used.

C.E. CARAMEL is of high colouring power, and has the flavour which tends to give the Essence the true Roasted Coffee Beans taste of genuine Coffee.

VEGETEX for imparting an appetising colour to soups, gravies, sauces, puddings and cakes, and for all requirements in the kitchen and bakehouse.

Further particulars gladly sent on request

Every delivery passes stringent laboratory tests before leaving our works.

LAMBERTS *for* CARAMEL

L. LAMBERT & CO., LTD., HIGH STREET, UXBRIDGE, MIDDLESEX
London Office: 4 PERCY STREET, LONDON, W.1 MUSeum 6102

Don't forget to write!

PREMIER MILLS have solved vital problems for many manufacturers. In all likelihood they could help you, so why not write asking for further details? Remember, they are standard equipment for leading manufacturers in this country and overseas which, in itself, is sufficient testimony.

★ Tests of your own materials can be carried out and reported upon by our Belvedere Laboratory

PREMIER MILL *combines*

SIMPLICITY OF CONSTRUCTION
EASY CLEANING
RELATIVELY HIGH OUTPUT
LOW POWER CONSUMPTION

PREMIER COLLOID MILLS LTD., Brettenham House, Strand, London, W.C.2 *Phone:* TEMple Bar 6272/3

SPOONER *Machines*

For THE MAKING of
MACARONI & SPAGHETTI

DRYING MACHINES for
ONIONS, HERBS, FRUITS,
VEGETABLES & GRAIN

BAKING MACHINES for
FOODSTUFFS of all VARIETIES

Machines of Reliability

The result of Research and Invention

THE SPOONER FOOD MACHINERY
ENGINEERING CO. LTD.
17 THE GROVE, ILKLEY, YORKS.

Tel. & Grams: Ilkley 947

LACTOSE

(SUGAR OF MILK)

Also Agents for:

F.M.S. COOKED POTATO FLOUR
and
"PETPRO" BRAND EMULSIONS
for the Bakery Trade.

L. THOMSON, LTD.

Tower Hill Station Buildings
London, E.C.3

Telephone: ROYAL 6071-2-3

Telegrams: ELTEEMILK-FEN-LONDON

" . . . EVERYONE DEALING WITH CHEMICALS LIKES TO HAVE (THIS BOOK) *on his desk. It begins properly with the index so that we can find the information required and is divided into sections dealing with constructional materials, power plant and water treatment, chemical plant, handling, conveying and transport, instruments and apparatus. Finally, there is much information about industrial and fine chemicals, including a glossary of trade names.*"—" Nature."

CHEMICAL INDUSTRIES

21st edition **xxviii + 406 pages** **11" × 8½"** **Cloth bound**

CONTENTS

Preface, Index to Technical Data, Index to Advertisers.
COMMERCIAL INDICES. Classified Index to Chemicals and Raw Materials. Classified Index and Constructional Materials. Trade Names and Marks.
CONSTRUCTIONAL MATERIALS. Glossary of Metals and Alloys. Glossary of Non-Metallic Materials. Chemical Engineering and Structural Engineering Tables.
FUELS AND STEAM RAISING. Properties and Uses. Combustion and Steam Raising.
POWER PRODUCTION AND TRANSMISSION. Prime Movers. Belting. Chain Driving. Other Methods.
WATER TREATMENT FOR INDUSTRIAL PURPOSES. Methods of Softening. Base Exchange and Ion Exchange Processes. Boiler Feed-Water Conditioning. Threshold Treatment. Tables.
CHEMICAL PLANT. Glossary of Chemical Plant. Principles of Chemical Engineering. Literature of Chemical Plant.
HANDLING CONVEYING TRANSPORT. Handling Tables.
INDUSTRIAL AND SCIENTIFIC INSTRUMENTS. Glossary of Instruments—Tables.
GLOSSARY OF INDUSTRIAL CHEMICALS.
FINE CHEMICALS. Glossary of Pharmaceuticals. Glossary of Perfumery Raw Materials.
CHEMICAL AND PHYSICAL TABLES. Physico-chemical Constants. Data of Organic Compounds. Data of Inorganic Compounds. Chemical Synonyms. British Standard Symbols.
MATHEMATICAL AND CONVERSION TABLES.
TABLES TO SECTIONS 3-5.

ONLY A FEW COPIES LEFT OF THIS EDITION, AND IT WILL NOT BE REPRINTED. ORDER NOW!
Price 30/- plus postage (Home 9d., Abroad 1/3)

A Works' Consultant writes:
" A most wonderful concise compilation of tables and useful matter which will prove both to the chemist and the engineer an extremely useful and ready work of reference."

Every chemist, technician, chemical engineer, executive—sales or purchasing—should have a copy of this valuable encyclopedia ready by his side for immediate reference. Indexed with nearly 5,000 entries giving immediate access to the subject.

Other Publications in the LEONARD HILL TECHNICAL GRO

Food Manufacture · Manufacturing Chemist · International Chemical Engineering and Process Industries · Paint Manu... Muck Shifter and Public Works Digest · Forecast · Fibres · Petroleum · Food Industries Manual · Dictionary of Dairying and Technical ...
***Associated Trade Publications:* Pottery and Glass · Building Digest**

LEONARD HILL LIMITED, 17 Stratford Place, London, W...

The PROTECTIVE LINING
& COATING FOR METAL
PLANT AND EQUIPMENT

FOR TANKS, VATS,
& FOOD EQUIPMENT
OF ALL KINDS—
ODOURLESS
TASTELESS
HYGIENIC

PRODOR-GLAS

100% BRITISH

A PRODUCT OF

PRODORITE LTD.

RESISTANT TO MOST
ACID PROCESSES also
ALCOHOL • BEER
BRINES • CIDERS
FATS • FRUIT JUICES
OILS • MILK • SALTS
SOLVENTS • STEAM
SYRUPS, ETC.

HEAD OFFICE & WORKS:
WEDNESBURY, STAFFS.
Telephone: 0284 (five lines)

Established 21 years

LONDON OFFICE:
ARTILLERY ROW, S.W.1
Telephone: 1547-8 Abbey

ADHESIVES

FOR ALL TYPES
OF FOOD PACKING
BY HAND OR
MACHINE
SAMPLES OR ADVICE
WILLINGLY SENT
ON APPLICATION.

ADHESIVES FOR
THE CANNING
INDUSTRY A
SPECIALITY

GLOY & EMPIRE ADHESIVES LTD.

ACME WORKS · CLAPTON · LONDON, E.5

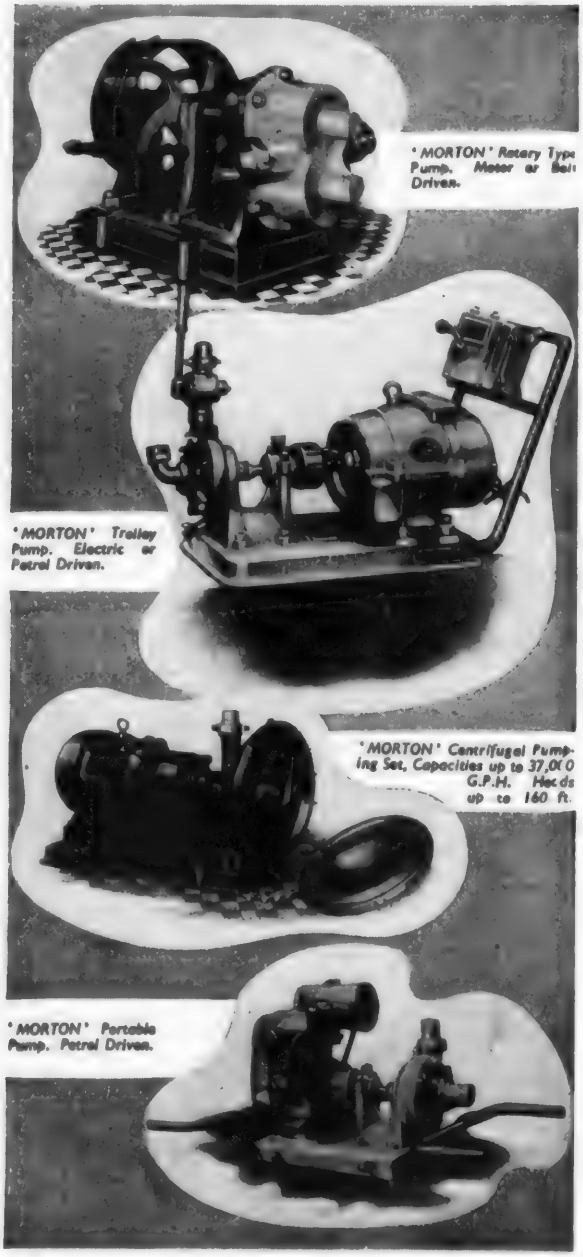
TELEPHONE: AMHerst 4746 (4 lines)

GLEMCO WORKS, LOUVAIN ST., FAILSWORTH, MANCHESTER. Telephone: Failsworth 1913

AUSTRALIA: MESSRS. J. DAVIES & SONS, LTD., 743 NORTH RD., MURRUMBENA, S.E.9, VICTORIA, AUSTRALIA
SOUTH AFRICA: MESSRS. A. J. NORTH & CO., LTD., 71, HOUT STREET, CAPE TOWN, SOUTH AFRICA

'MORTON' PUMPS

foremost for pumping viscous and non-viscous food products. Cold or Hot. Centrifugal and Rotary Types, fixed or portable. Electric, Petrol or Belt driven.



'MORTON' Rotary Type Pump. Motor or Belt Driven.

'MORTON' Trolley Pump. Electric or Petrol Driven.

'MORTON' Centrifugal Pumping Set, Capacities up to 37,000 G.P.H. Heads up to 160 ft.

'MORTON' Portable Pump. Petrol Driven.

Full particulars from the makers :

ROBERT MORTON & CO., LTD.

TRENT WORKS — Telephone: Burton-on-Trent 3033-4

BURTON-ON-TRENT — Telegrams: "Morton, Burton-on-Trent"

Prompt Supplies—NOW

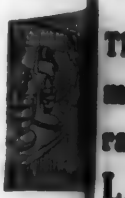
- **'DUCOL' GLYCERYL MONOSTEARATE** Natural or Self-emulsifying. Snow-white, food quality. Powder and Block forms.
- **'DUCOL' BAKERS' SWEETENED COOKING FAT.**
- **'DUCOL' VANILLIN.** Milk soluble.
- **'DUCOL' LACTOSE.** Food and B.P. qualities.
- **'DUCOL' COCOA BUTTER BLEND.**
- **'DUCOL' ALGINATES.**
- **'DUCOL' SOLVENTS.** Solvents and Dispersants for Essential Oils, Colourings, Essences, etc. Odourless, tasteless, colourless. Freely water-miscible.
- **'DUCOL' ICE CREAM EMULSIFYING and STABILISING POWDERS.**
- **'DUCOL' EDIBLE OILS.** Teaseed, Olive and Almond. Ordinary and self-emulsifying types.
- **'DUCOL' LECITHIN.**

Samples and quotations by return. Regular, unrestricted supplies to all parts. Warehouses and Depots all over British Isles. Many other Confectionery and Bakery Products listed on request.

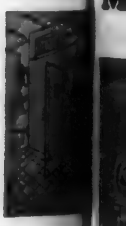
DUBLIN CHEMICAL CO. LTD.

39/41, DAME STREET, DUBLIN

Capacitor Start Motors



FOOD MANUFACTURE



REFRIGERATION

Precision and Quality

EST 1914 SEM

Range single phase ¼, ⅓, ½, ¾ and 1 h.p. 1420 r.p.m. with drip-proof enclosure. Prompt deliveries.

SMALL ELECTRIC MOTORS LTD.
BECKENHAM KENT ENGLAND

Grams: "SEMOCO" Beckenham Phone: BECkenham 0014 & 1

London Office :
Terminal House, 52 Grosvenor Gardens, S.W.1 Phone: SLOane 1

THE RATSOURIS SERVICE

Every year thousands of pounds worth of damage to industrial premises is owed to insect and rodent pests. More and more managing directors everywhere are calling in the Ratsouris Service to terminate this expense cheaply and effectively; and many well-known organisations will bear testimony to its efficiency.

PRELIMINARY SURVEYS ARE FREE

PUTS PAID TO PESTS

WITH THANKS

Ratsouris Ltd., 50 *Central Street*,
LONDON, E.C.1.
Phone CLE 3816

PURDY

The World's most complete range of LABELLING MACHINES

PURDY "WORLD" LABELLERS for bottles, jars, tins, cartons and other packages. Automatic and hand-fed models, placing up to three labels simultaneously on round, flat, recessed or irregular surfaces. Centre gumming. All-round labelling. Top-strapping or sealing. Automatic dating and counting attachments.

PURDY "NEW WAY" LABELLER for round cans. A high-speed, super-adjustable machine delivering up to 500 cans per minute Positive change in about two minutes, without tools, to any size between $1\frac{3}{4}'' \times 1\frac{3}{4}''$ and $4\frac{3}{8}'' \times 9''$ on model "M-H." Other models take larger or smaller sizes. Special Model "P-G" takes cans fitted for handles.

PURDY
PATENT MACHINERY COMPANY LTD
Euston Buildings Gower Street, N.W.1
LONDON

PURDY

DEHYDRATION EQUIPMENT LTD.

for

New Patented Scientific Drying Equipment and Finest Quality English Herbs and Vegetables from our own Plants.

TEL.: FELTHAM 2483
HAMPTON RD., HANWORTH, MIDDLESEX

SINCE **FULLER HORSEY SONS & CASSELL** 1807

Specialists in the SALE & VALUATION of FOOD MANUFACTURING PLANTS OF EVERY DESCRIPTION

10, BILLITER SQUARE, LONDON, E.C.3
Telephone: Royal 4861

GELATINES

ALL GRADES

SHEET & POWDER

complying with standards of purity of the Food & Drugs Act

Manufacturers:

CLEVELAND PRODUCT Co. Ltd.
CARGO FLEET ROAD, MIDDLESBROUGH
Tel. : 422[illegible] Grams : CLEPRO

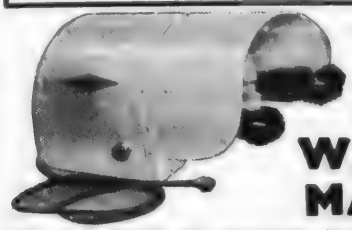
TO MANAGING DIRECTORS.—One of the most rewarding "amenities" you can provide for your office or works staff is a circulating library of their own. Our unique subscription service provides the books—outstanding novels, autobiographies, travel and country books, etc. A staff committee operates the Library, on self-supporting lines if desired, and the whole scheme can be made an outstanding success at negligible cost.—Write for details, The Choices Library Ltd., Industrial Dept., 5a, Avenue Parade, N.21.

The GREW

Selling and Buying Organisation covers

ALL IRELAND

Central Office:
JAMES GREW & CO. (Eire) LTD.
Brokers to Food Manufacturers
54 DAWSON STREET, DUBLIN
Telegrams: "Grew Dublin" Telephone: 21003/4
ASSOCIATED WITH GREWS OF PORTADOWN NORTHERN IRELAND



IMMEDIATE DELIVERY

IMPETUS

TWIN BRUSH ELECTRIC

WASHING MACHINE

FOR ALL TYPES OF BOTTLES, JARS, CONTAINERS, ETC.

Fully enclosed, extremely robust with detachable splash cowl. Finished white stoved enamel, this machine will stand up to hardest usage. Complete with brushes, shock-proof switch, cable, etc. (brushes provided to suit individual needs) for 200 250 v. single phase (other currents available) **£18.12.6** ex works

APPLY FOR SPECIAL F.O.B. EXPORT PRICES

JOHN F. M. STEEL, Dept. 14, Bingley, Yks. Tel. No. (4 lines)

TORRAX

MALT FLOURS

WILLIAM GLOSSOP & BULAY LTD.

MALTSTERS AND MILLERS
NORTHUMBERLAND AVENUE HULL

INSTRUMENTS for the indication, recording and controlling of temperature, pressure, liquid level, etc.

GENERAL BULLETIN B.18, giving detailed and illustrative summary of our industrial and scientific instrument range, available on request.

FOR THE

Instrumentation

OF

Production Processes

CONSULT

NEGRETTI & ZAMBRA LTD

122 REGENT STREET, LONDON, W.1

Telephone · Regent 3406

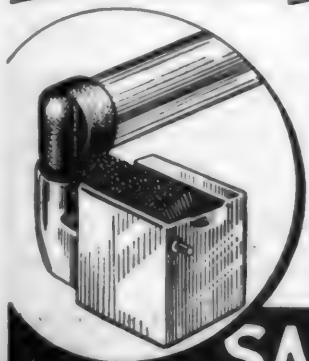
Switch over to the

RODNEY

BUTTERFLY BRAND

AUTOMATIC SEALING MACHINE

CUT OUT WASTE CUT COSTS STEP UP OUTPUT

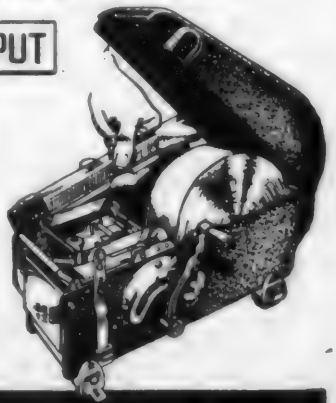


An entirely new machine for speedy and efficient sealing of all types of parcels and cartons.

Automatic moisture control gives a long period of uninterrupted use.

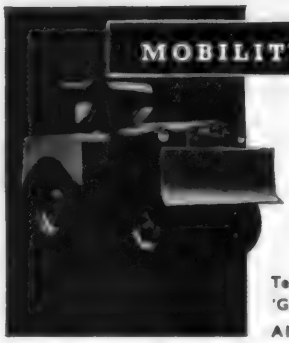
Send for leaflet P.W. 3002 which fully illustrates and describes the new and unusual features of the Rodney Automatic Sealing Machine.

Export Orders for immediate dispatch.



SAMUEL JONES & Co LTD

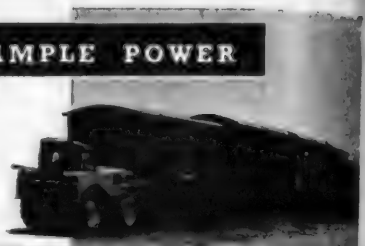
NEW BRIDGE STREET LONDON E.C.4 PHONE CENTRAL 6500



MOBILITY — LOW COST AND AMPLE POWER

For a low capital outlay, the Muir-Hill Model 100 Shunting Tractor enables you to speed up on wagon handling, with economy in running and a high degree of manœuvrability. Fitted with tow bar and capable of dealing with up to 100 tons on straight level rail.

Illustrated Brochure No. FM/40 on request.



E. BOYDELL & CO., LIMITED
MANCHESTER 16
Telephone : Trafford Park 1641
'Grams: "Muirhil" Manchester
AND AT LONDON, BIRMINGHAM & GLASGOW

Muir-Hill *Shunting Tractor*

dm EB. 86

DRIED VEGETABLES
in Strips and Powders — also
HERBS
Produced in the United Kingdom by F.M.S. (Farm Products Ltd.) London, Wisbech etc. *Originators of Vegetable Drying in the U. K.*

Sole Selling Agents
GEO. W. RHODES & SON LTD.
71A QUEEN VICTORIA STREET, LONDON, E.C.4
Telephone: CENTRAL 3711/8860

INDUSTRIAL & COMMERCIAL
PROPERTIES, PLANT, MACHINERY AND EQUIPMENT
VALUATIONS
for the purposes of Sale or Purchase, Insurance Cover, Balance Sheet, etc.
CHAMBERLAIN & WILLOWS
— SURVEYORS AND VALUERS —
23 MOORGATE, LONDON, E.C.2
City 6013 (6 lines)

PX LTD.
HEAD OFFICE:
CLEAVERS
CHAMBERS
HIGH STREET
RUSHDEN
Phone: 661

LONDON	3-6 MING ST., POPLAR, E	Phone: East 1611/2/3
MANCHESTER	FENTON STREET WEST GORTON	Phone: East 1628/9
LEICESTER	CHARTER STREET	Phone: 65725/6
NORTHAMPTON	HOUGHTON RD	Phone: 3687
RUSHDEN	WASHBROOK RD	Phone: 200/1
BIRMINGHAM (CENTRAL CARRIERS)	SHEEPCOTE STREET	Phone: Midland 6767/8/9
NORWICH	52 SURREY STREET	Phone: 20474/5/6
CAMBRIDGE	95 EAST ROAD	Phone: 4730

OUR SPECIALITY—
BULK COLLECTION FOR RETAIL DISTRIBUTION.
Storage facilities provided.

EDME
Quality Malt Products
THE CHOICE OF THE FIRST CLASS BUYER
EDME LTD., Imperial House, 84-86, Regent Street, LONDON, W.
Phone: Regent: 5563-4 Works: Mistley, Essex *Grams: Edme, Picc, Lond*

IMMEDIATE STOCK SERVICE in a wide range of widths
SELF ADHESIVE CELLULOSE TAPE
SAMUEL JONES & CO LTD
QUALITY PRODUCTS regularly used by all leading manufacturers

For Sale in EIRE
as a going concern

Manufacturing and Importing Company

engaged in the food business.

TURNOVER FOR 1947

£125,000

Audited figures available.

Holders of Sole Agency Rights in Eire for leading food manufacturers.
Only genuine enquiries considered.

BOX 2294, FOOD MANUFACTURE, 17 Stratford Place, London, W.1

PREVENIT PAINT

Brings you immunity from the ravages of Mould or Fungus on interior walls, and at the same time enhances the amenities of your Factory Premises, both on account of hygiene and maximum light reflection value.

'Prevenit' is a proven success—not an experiment—made on a water base, hence easy to apply—no objectionable smell—available in snow white or cream and delivery ex stock.

Descriptive literature gladly sent free on request

CLARILOID CHEMICAL COMPANY, LTD.

Sole Manufacturers & Patentees

WELLS, SOMERSET

MISCELLANEOUS SALES

FOR Sale, Stainless Steel Steam-Jacketed Pan, 50 gall. capacity, 30 lb. pressure, new and unused. Complete with all fittings; Copper Steam-Jacketed Pan, secondhand, reasonable condition, 40 gall. capacity, on wooden stand, £30; Red Cabbage Slicing Machine, self-contained electric motor, capacity 1 to 2 tons per hour, new and unused, £150—Box B2206.

1-LB. glass jars for sale, quantity approx. 200,000.—T. Gunn (Rayleigh) Ltd., 206, London Road, Rayleigh, Essex. Tel.: Rayleigh 87.

STEAM Cooking Retorts, new, from stock, 36 in. by 72 in. by 36 in. high. Steel plate construction. With two inside trolleys. For 10 lb. sq. in. working pressure.—Details from F. J. Edwards Ltd., 359, Euston Road, London, N.W.1. Tel.: Euston 4681.

GLASS jars as new, complete with lids, in the following sizes: ½ and 1 gall., 1-lb. 10-oz. fancy 8-oz. square jars, 1½-oz. and 3-oz. paste jars. Immediate delivery.—Box B2282.

OLIVES, various kinds, and Gherkins, sold in barrels, 1 gall. or small packs at keen prices.—Box B2283.

WAXED Cartons with lids; new, perfect condition, 4-oz., 4½-oz. and 6-oz. capacity. Keen prices, immediate delivery.—Bak-In It Case Co., Reddish, Stockport.

JUST published: 7,048 money-making, practical, tested, ready-to-use industrial recipes and processes for all kinds of commodities and preparations. Edition limited, demand very heavy.—Send p.c. for descriptive Leaflet MR34 (no obligation) to Shaw Publishing Co. Ltd., 180, Fleet Street, London, E.C.4.

FOR sale, Olive Oil in 45-gall. Drums at 35s. per gallon. In 1-gall. Drums at 40s. per gallon. Drums free. Carriage paid.—Box B2335.

TUBULAR Steel Trucks of amazing lightness and strength, fitted with platform, 5 ft. by 2 ft. 9 in., and metal-bound hinged sides 8 in. high, two roller-bearing wheels fitted with pneumatic rubber tyres. Easily handled from either end. Capacity 10 cwt. Ex stock, £12 17s. List on request.—The Sterling Pump Co. Ltd., Spalding.

Distillers and manufacturers of

Natural and Terpeneless Oils, Concentrated Fruit Juices, Flavour Compounds

and raw materials for the Food Industry and allied trades.

T. HARRISON & CO. LTD.

BURNLEY HOUSE, WILLESDEN
LONDON, N.W. 10

DRIED VEGETABLES
•
DRIED HERBS
•
SEEDS and SPICES
•
GROUND PAPRIKA

AGRICULTURAL AND CHEMICAL PRODUCTS, LTD.
82 BISHOPSGATE, LONDON, E.C.1
Telephone: London Wall 2934

WRAPPING AND CARTONING MACHINES
PAILLARD & BENOIT
S.I.S. WRAPPING MACHINES LTD.
36, VICTORIA ST., LONDON, S.W.1
Sole Agents for Swiss Industrial Society
Invite your enquiries *Phone ABBEY 4519*

MISCELLANEOUS SALES

WE are pleased to offer for quick delivery new fully Automatic Labelling Machines with outputs up to 8,000 bottles per hour for manufacturers on export production. Please send sample bottles and labels for a quotation.—Box B2308.

VANILLIN, 100%, 7-lb. tins, 27s. 6d. lb.; Olive Oil, B.P., 2-gall. tins, 40s. gall.—Box B2295.

FINEST quality imported salad cream shortly available.—Buyers write Box B2299.

WAXED Tubs, 4-oz., 6-oz., 8-oz.; waxed trays, 3-oz., 4-oz., all stout quality, ex stock. Greaseproof, 20 in. by 30 in.—Auto-Type, Albert Road, Middlesbrough.

RENNET Extract for sale, 2 by 21 gall. barrels, app. perfect condition; offers, ex Glasgow.—Leonard Baker, Cranston St., Glasgow.

DATE Syrup, imported. Limited supplies available only to direct users.—Please apply Box B2312.

BENZALDEHYDE, chlorine-free (M. & B. Amandol). Offering one ton 15% under manufacturers' price.—Please apply Box B2313.

SWEETENED Fat, Lactose B.P., Dried Apricot Pulp, Candied Orange Peel, Chocolate Spread, Apple Juice and other Fruit Syrups containing 65% sugar, Tomato Ketchup, Salad Cream, Ginger in Syrup, Teaseed Oil; only bulk supply shortly available.—Buyers write Box B2315.

INQUIRIES invited for weekly supply of small table chicken.—Clover, Kempston, Bedford.

CAULIFLOWER in brine: Northern Ireland produce of high standard quality; price moderate; early delivery.—Enquiries to Box B2323.

OVER 50,000 gross new bottles and jars, standard types for sauces, ketchup, vinegar, olive oil, honey, ginger, malt, whiskey, mineral waters, lighter fuel, etc.; also 25,000 gross new tins, 100,000 cartons, 20,000 strong wooden cases, 200,000 sheets waterproof and brown wrapping paper ready for delivery. Quotations by return of post. Continuity of supplies guaranteed.—Box B2325.

NEW Tilling-Stevens motors, ¾-1 h.p. single phase; ½-2 h.p. 3 phase, ex stock. Push Button Starters for Fraction h.p. motors, fitted with three overloads, ex stock; other motors up to 100 h.p. with Starters. Switch Fuses 10, 15-amp D.P. and T.P. ex stock.—Dept. 9, Wm. Don & Partners, Crown Chambers, 45, Hunslet Road, Leeds, 10. Tel.: Leeds 27580.

FOR sale, Rotary dicer, brand new, packed in original packing case. Price £550 delivered.—Write Box B2331.

BAGS, transparent viscose film, 600,000 6¾ by 3⅝ in., 20s. 11d. per 1,000; 300,000 block-bottomed, 5¾ by 3⅝ in., 20s. per 1,000.—J. H. Newman and Co. Ltd., 128/134, Baker Street, W.1.

50 tons high grade Edible Pea Flour for sale, Hull. — Prices, samples apply to Geo. Morrell & Sons Ltd., 46 East Parade, Harrogate.

OILS & FATS problem solved. Economical and guaranteed finest food quality. Samples and quotations on request.—J. J. Vigon & Co., 30 Fenchurch Street, E.C.3. Mansion House 0466/9.

SWIFTLY and surely DAK Sticky Rat Traps will rid your premises of every Rat and Mouse — read users' actual experiences in pamphlet "100,000,000 Enemies" (*post free on request*). Extensively used by H.M. Government. Tins to make 3 traps 3/-; 12 traps 8/6d.; 20 traps 14/6d., from Ironmongers and Seedsmen or post paid from Makers. **KAY BROTHERS LIMITED**, Kayborough, Reddish, Stockport. (Send P.O.)

Supersedes Poisons

MISCELLANEOUS WANTS

CAKE Decorations, supplies wanted.—Box B2298.

CROWN corks required, fitted with composition or second-grade natural cork discs. Willing to purchase surplus stocks as is. 6½d. per gross ex seller's factory.—Write Box B2296.

GELATINES
PURE FOOD QUALITIES

Enquiries from licensed and other authorised buyers solicited.

PROMPT DELIVERIES

K. J. LIEBMANN
14 Seething Lane, London, E.C.3
Tel.: ROYal 1946/7

MICE.—You can't afford mice on your premises. Be rid of them by sprinkling "Scram" round the holes and where the traces are. Non-poisonous—harmless to pets. Prices: 14-oz. tins, 1s.; 2-lb. tins, 20s.; 4-lb. tins, 35s.; 7-lb. tins, 60s. — Order from the manufacturers (Dept. F.M./C), Scram Products Ltd., Dartmouth Park Hill, N.W.5.

L. STENG & SON
342 KENNINGTON RD.
LONDON, S.E.11
•
HERBS
ENGLISH AND IMPORTED
SPICES
CONDIMENTS
DRIED VEGETABLES
•
ENQUIRIES INVITED
RELIANCE 1136/7

100% SATISFACTION
GUARANTEED
WATER SOFTENERS
ON
RENTAL MAINTENANCE
NO CAPITAL OUTLAY
LIME-FREE WATER
& GENERAL SERVICES LTD.
7 Grosvenor Gardens, London, S.W.1

SITUATIONS VACANT

WANTED, services of Chemist with experience in the manufacture of sauces, malted foods and cereals, in advisory capacity and later for full time employment. Factory within 20 miles easy reach of London.—Box B2311.

CO-OPS. Experienced Salesman required for contacting Co-operative Societies' Buyers of Foodstuffs throughout the country. Salary, expenses and commission. Applicants will be required to show proof of live connections and first-class sales record.—Box B2317.

RESEARCH Chemist required for Midlands Food Factory. At least B.Sc. honours in chemistry or bio-chemistry. Salary according to experience, qualifications.—Apply giving details experience, qualifications, salary required, Box B2318.

LONDON COUNTY COUNCIL

REQUIRED at Smithfield College of Food Technology, Eagle Court, St. John's Lane, E.C.1, to commence in January, 1949, part-time visiting lecturers in basic scientific subjects for students engaged in the Food Manufacturing Industry on Monday and Thursday afternoons), including elementary physical and chemical concepts, elementary microbiology, principles of food preservation, public health aspects of food handling and rodent and insect pests (lecture and practical). Fee per attendance: 13s. 6d. for the first hour and 9s. for each subsequent hour. Application forms (stamped addressed foolscap envelope necessary) from the Principal at the College. (2170.)

REQUIRED for several regions in England: technical representatives working on commission for the sale of modern plant for the concentration of fruit juices, milk, whey, chemicals, etc. Good commission offered to the right men.—Box B2321.

DEMONSTRATOR required by Manchester food manufacturers. Must be capable of demonstrating to bakeries, canteen supervisors, chefs and other similar users of the firm's products. Previous experience essential. Must be prepared to travel throughout the country. Good salary and prospects.—Box B2322.

CHEMICAL Engineer, preferably single, with knowledge of production of cornflour and other cereal products, required for progressive company in East Africa. Salary £60/70 per month; free accommodation.—Write in first instance, stating age, qualifications, etc., to Box M.4068, Haddons', Salisbury Square, London, E.C.4.

AGENTS or representatives wanted, calling on Bakers and Bakers' Sundriesmen. Territory available London area, Wales and North of England, to introduce a first-class emulsion and food products already well known. Every encouragement given to the right men. When replying, please give full particulars of connection and lines already handling.—Box B2291.

EXPERIENCED Chef required for research on ketchup and allied products and for control of the manufacture of soup and bakery lines in rapidly expanding factory in Hertfordshire.—Apply Box B2209.

SUGAR Boiler accustomed to quality and quantity production for leading Scottish House.—Write full details including wages required to Box 1130, Robertson and Scott, Edinburgh 2.

FOOD Factory, East London, require man with some experience in pickle or fish paste production as Works Manager of small branch factory. Progressive and permanent position.—Write stating full details and salary required to Box B2231.

REPRESENTATIVES having connections with Food Manufacturers required for London and all areas by Waxed Paper Manufacturer.—Write with full details, Diamond Waxed Papers, Heybridge, Maldon, Essex.

REPRESENTATIVES required, London area, also Home Counties and Midlands. Old-established (small) Sauce Manufacturing Company wishes to obtain representation for the sale of its products, particularly in the London area. Freelance representation on commission basis preferred, but would consider part expenses and commission basis. Applicants must be well established with Wholesale Houses, Multiple Stores, Co-operative Stores, etc.—Box B2334.

CHEMIST wanted for large food factory in Birmingham, to start research on Flavour, Ingredients, etc. Young man preferred.—Box B2326.

CEREAL chemist required to take charge of Laboratory and Test Bakery of 40-sack Flour Mill and Provender Mill in north-west area. Applicants should be fully conversant with all modern routine tests of flour and feeding stuffs, and capable of carrying out experimental work.—Applications should be addressed to Carr's Flour Mills Ltd., Solway Mills, Silloth.

Classified Advertisements

in FOOD MANUFACTURE

MUST BE PREPAID

3d. a word, minimum 4s.

Box numbers 1s. extra.

Replies to

BOX NUMBERS

should be addressed to

Food Manufacture, 17, Stratford Place, W.1

SITUATIONS VACANT

WANTED, representatives calling on Food Manufacturers, Bakers' Sundriesmen, Bakers, etc., to handle attractive lines of essential materials. Good commission.—Box B2300.

LEADING manufacturers in Lima, Peru require working foreman of British nationality, age 25-35, single or married with not more than 2 children (who must be of the same sex). Must have sound knowledge of high and medium class biscuit manufacture, preferably automatic plant. Starting salary will be $1,500 per month with bonuses (rate of exchange 26·16 to £1). Free house and light. The house, which is furnished, is a new bungalow with a large lounge, dining room, bath room, two bedrooms, electric kitchen, servants' quarters and small garden. Air passage will be paid for man and wife and up to two children. Contract will be for three years and will be renewable, with three months' passage paid holiday at the end of each three years. Knowledge of Spanish not essential but successful candidate will be expected to study the language. Applicants for the post should be temperate, in good health and able to control labour tactfully.—Give full details of working career and include a photograph to Box B2324.

DRAUGHTSMAN required in Engineer's Office of Canning Factory in East Anglia, preferably with experience of Food Plant. Single man preferred owing to housing accommodation. Knowledge of Steam, Water, and Effluent Disposal layouts an advantage.—Write full particulars of experience and salary required, Box B2329.

YOUNG Chemist, 20-25 years, preferably with experience of food analysis, required for small laboratory of preserve manufacturers, in Sussex.—Please write giving full details of experience, age and salary required, to Box B2293.

WANTED, Working Works Manager familiar with the manufacture of cake flours, etc. Used to handling staff and taking responsibility. Good salary and permanency.—Apply with fullest particulars to Mansfield Food Products Company, Dame Flogan Street, Mansfield.

CHEMICAL Engineer. Young man of an enquiring nature with ability to write, interest and some knowledge of world affairs required to edit a technical journal. Help and direction given. Large established Company. Commencing salary £700. Three refs. copies.—Box B2301.

GENTLEMAN, young, chemical engineer or chemist to represent a technical export journal. Selling experience unnecessary. A man with confidence and initiative will earn a high salary if successful. £600 p.a. and commission.—Apply with copy references to Box B2302.

A PROGRESSIVE food manufacturing company in the South London area has vacancies for the following:—(1) Qualified Food Chemist to take charge of analytical and factory control work, commencing salary £600/£700 approximately, according to experience and qualifications. (2) Food Chemist of or approaching Degree standard for research and development work, salary £375/£450 approximately, according to experience and qualifications. Permanent position, excellent prospects, superannuation scheme, and 5-day week.—Write stating age, experience and qualifications to Box M.4004, Haddons', Salisbury Square, London, E.C.4.

POLAK & Schwarz (England) Ltd., 50, Great Cambridge Road, Enfield, Middx., require lady laboratory assistant for Essence Laboratory. Some experience in the Food Industry an advantage.—Write in strict confidence to General Manager, giving full details of age, education, experience, etc.

GEORGE COHEN'S 600

FOR SALE

ONE Self-generating Caramel Mixer comprising jacketed copper Pan 2 ft. 2 in. diam. by 1 ft. 9 in. deep (to take 1 cwt. of toffee). Pan mounted on c.i. stand and provided with fast and loose pulley driven bow and scrapper type agitator. Pan arranged to tilt, suitable for 100-lb. working pressure. Rise and fall of agitator mechanically operated. Gas stove with small blower fitted under Pan, blower driven by pulley from main shaft. Heat applied to water by gas burner and steam generated in jacket of Pan.

Stainless steel Food Preparation Tables, 7 ft. 8 in. by 3 ft. 8 in. by 2 ft. 8 in. high, and 5 ft. 8 in. by 2 ft. 8 in. high. Polished, with adjustable feet. Available for delivery mid-December.

One Twin Roll Drier by Goudche of Gouda, Holland. Rolls 6 ft. 7 in. long by 2 ft. 3 in. diam., steam heated through trunnions and driven from 10 h.p. 400/3/50 electric motor through 1000:61 reduction gearbox on common bedplate. Drier equipped with fume hood, 2 discharge worm conveyors, and one spare roll.

All types of stainless steel Storage and Process Vessels. Large stock available for immediate delivery.

Four stainless steel Steam Jacketed Tilting Mixers, 18 in. diam. by 18 in. deep, mirror finish inside and out, rubber covered paddle agitator, driven through Croft Worm Reduction Gearbox from ½ h.p. Crompton Parkinson totally enclosed geared motor with Allen West Starter. Mixers mounted in "A" frames.

One Electric Mincing Machine by Lancashire Dynamo & Crypto, type A.12, for 200/220 v. single ph. 50 cyc., complete with 16 in. diam. white enamel feed bowl.

One "U" shaped horizontal unjacketed Dough Mixer by Alfred Hunt, 2 sack size. Mixer body 3 ft. 8½ in. long by 2 ft. 2½ in. wide by 2 ft. 10 in. deep, fabricated from sheet aluminium with c.i. ends. Vitreous enamelled double helical agitators. Drive through totally enclosed reversing gearbox. Automatic tilting. Mounted on c.i. bedplate fitted with tempering tank 18 in. by 16 in. by 32 in. deep.

One 2-stage Curd Mill by Gardner, comprising 2 sets of twin serrated rolls, 1 ft. 10 in. long by 9 in. diam. Each pair of rolls spring loaded and independently driven through gearing by belt pulley. First pair of rolls arranged vertically above second pair. Frame c.i. construction fitted with 3 hinged inspection doors, 14 in. long by 5 in. wide.

One Vacuum Evaporating Plant by Morton comprising tinned copper Pan, approx. 8 ft. overall depth by 5 ft. i.d. Steam jacketed with internal steam coil of 3 in. o.d., solid drawn copper pipe, complete with Condenser and Vacuum Pump. Capacity of Evaporator 300 gall. per hour.

One 3-throw Homogeniser by Astra, approx. capacity 300 gall. per hour, 1¾ in. bore by 4½ in. stroke, bronze rams and pump block, triple roller chain driven, eccentric mechanism enclosed in oil bath, 2½ in. inlet, ¾ in. outlet. No motor included.

One 4-throw Homogeniser by Rannie of Copenhagen, capacity approx. 500 gall. per hour, 1¾ in. bore by 2½ in. stroke. Fitted stainless steel rams and pump block, and bronze guide bearings running in c.i. outercasing 1¼ in. diam. inlet and 1¾ in. diam. outlet. Drive by twin inverted-tooth sprocket and chain. Motor platform mounted over machine. Motor not available.

One Standard 5-roll Chocolate Refiner by Joseph Baker, water cooled, chilled rolls, 33 in. long by 13 in. diam., top roll 19 in. diam. Fast and loose pulley drive, through helical and spur gearing complete with oil bath, gear cases, feed hopper, etc.

GEORGE COHEN SONS & CO. LTD.

SUNBEAM ROAD, LONDON N.W. 10 Tel.: Elgar 72...

& STANNINGLEY, Nr. LEEDS Tel.: Pudsey 2241

The Strongest Vanilla Flavour

VANOLEUM

1 oz. (2/6) makes a pint of essence

For further details apply

ARTHUR WHITTAKER

Newton Heath, Manchester, 1

MISCELLANEOUS SALES

FOR Sale, Stainless Steel Steam-Jacketed Pan, 50 gall. capacity, 30 lb. pressure, new and unused. Complete with all fittings; Copper Steam-Jacketed Pan, secondhand, reasonable condition, 40 gall. capacity, on wooden stand, £30; Red Cabbage Slicing Machine, self-contained electric motor, capacity 1 to 2 tons per hour, new and unused, £150—Box B2206.

1-LB. glass jars for sale, quantity approx. 200,000.—T. Gunn (Rayleigh) Ltd., 206, London Road, Rayleigh, Essex. Tel.: Rayleigh 87.

STEAM Cooking Retorts, new, from stock, 36 in. by 72 in. by 36 in. high. Steel plate construction. With two inside trolleys. For 10 lb. sq. in. working pressure.—Details from F. J. Edwards Ltd., 359, Euston Road, London, N.W.1. Tel.: Euston 4681.

GLASS jars as new, complete with lids, in the following sizes: ½ and 1 gall., 1-lb. 10-oz. fancy 8-oz. square jars, 1½-oz. and 3-oz. paste jars. Immediate delivery.—Box B2282.

OLIVES, various kinds, and Gherkins, sold in barrels, 1 gall. or small packs at keen prices.—Box B2283.

WAXED Cartons with lids; new, perfect condition, 4-oz., 4½-oz. and 6-oz. capacity. Keen prices, immediate delivery.—Bak-In It Case Co., Reddish, Stockport.

JUST published: 7,048 money-making, practical, tested, ready-to-use industrial recipes and processes for all kinds of commodities and preparations. Edition limited, demand very heavy.—Send p.c. for descriptive Leaflet MR34 (no obligation) to Shaw Publishing Co. Ltd., 180, Fleet Street, London, E.C.4.

FOR sale, Olive Oil in 45-gall. Drums at 35s. per gallon. In 1-gall. Drums at 40s. per gallon. Drums free. Carriage paid.—Box B2335.

TUBULAR Steel Trucks of amazing lightness and strength, fitted with platform, 5 ft. by 2 ft. 9 in., and metal-bound hinged sides 8 in. high, two roller-bearing wheels fitted with pneumatic rubber tyres. Easily handled from either end. Capacity 10 cwt. Ex stock, £12 17s. List on request.—The Sterling Pump Co. Ltd., Spalding.

Distillers and manufacturers of

Natural and Terpeneless Oils, Concentrated Fruit Juices, Flavour Compounds

and raw materials for the Food Industry and allied trades.

T. HARRISON & CO. LTD.

BURNLEY HOUSE, WILLESDEN
LONDON, N.W. 10

DRIED VEGETABLES
•
DRIED HERBS
•
SEEDS and SPICES
•
GROUND PAPRIKA

AGRICULTURAL AND CHEMICAL PRODUCTS, LTD.
82 BISHOPSGATE, LONDON, E.C.1
Telephone: London Wall 2934

WRAPPING AND CARTONING MACHINES
PAILLARD & BENOIT
S.I.S. WRAPPING MACHINES LTD.
36, VICTORIA ST., LONDON, S.W.1
Sole Agents for Swiss Industrial Society
Invite your enquiries — Phone ABBEY 4519

MISCELLANEOUS SALES

WE are pleased to offer for quick delivery new fully Automatic Labelling Machines with outputs up to 8,000 bottles per hour for manufacturers on export production. Please send sample bottles and labels for a quotation.—Box B2308.

VANILLIN, 100%, 7-lb. tins, 27s. 6d. lb.; Olive Oil, B.P., 2-gall. tins, 40s. gall.—Box B2295.

FINEST quality imported salad cream shortly available.—Buyers write Box B2299.

WAXED Tubs, 4-oz., 6-oz., 8-oz.; waxed trays, 3-oz., 4-oz., all stout quality, ex stock. Greaseproof, 20 in. by 30 in.—Auto-Type, Albert Road, Middlesbrough.

RENNET Extract for sale, 2 by 21 gall. barrels, app. perfect condition; offers, ex Glasgow.—Leonard Baker, Cranston St., Glasgow.

DATE Syrup, imported. Limited supplies available only to direct users.—Please apply Box B2312.

BENZALDEHYDE, chlorine-free (M. & B. Amandol). Offering one ton 15% under manufacturers' price.—Please apply Box B2313.

SWEETENED Fat, Lactose B.P., Dried Apricot Pulp, Candied Orange Peel, Chocolate Spread, Apple Juice and other Fruit Syrups containing 65% sugar, Tomato Ketchup, Salad Cream, Ginger in Syrup, Teaseed Oil; only bulk supply shortly available.—Buyers write Box B2315.

INQUIRIES invited for weekly supply of small table chicken.—Clover, Kempston, Bedford.

CAULIFLOWER in brine: Northern Ireland produce of high standard quality; price moderate; early delivery.—Enquiries to Box B2323.

OVER 50,000 gross new bottles and jars, standard types for sauces, ketchup, vinegar, olive oil, honey, ginger, malt, whiskey, mineral waters, lighter fuel, etc.; also 25,000 gross new tins, 100,000 cartons, 20,000 strong wooden cases, 900,000 sheets waterproof and brown wrapping paper ready for delivery. Quotations by return of post. Continuity of supplies guaranteed.—Box B2325.

NEW Tilling-Stevens motors, ½-½ h.p. single phase; ½-2 h.p. 3 phase, ex stock. Push Button Starters for Fraction h.p. motors, fitted with three overloads, ex stock; other motors up to 100 h.p. with Starters. Switch Fuses 10, 15-amp D.P. and T.P. ex stock.—Dept. 9, Wm. Don & Partners, Crown Chambers, 45, Hunslet Road, Leeds, 10. Tel.: Leeds 27580.

FOR sale, Rotary dicer, brand new, packed in original packing case. Price £550 delivered.—Write Box B2331.

BAGS, transparent viscose film, 600,000 6½ by 3½ in., 20s. 11d. per 1,000; 300,000 block-bottomed, 5½ by 3½ in., 20s. per 1,000.—J. H. Newman and Co. Ltd., 128/134, Baker Street, W.1.

50 tons high grade Edible Pea Flour for sale, Hull. — Prices, samples apply to Geo. Morrell & Sons Ltd., 46 East Parade, Harrogate.

OILS & FATS problem solved. Economical and guaranteed finest food quality. Samples and quotations on request.—J. J. Vigon & Co., 30 Fenchurch Street, E.C.3. Mansion House 0466/9.

SWIFTLY and surely DAK Sticky Rat Traps will rid your premises of every Rat and Mouse — read users' actual experiences in pamphlet "100,000,000 Enemies" (*post free on request*). Extensively used by H.M. Government. Tins to make 3 traps 3/-.; 12 traps 8/6d.; 20 traps 14/6d., from Ironmongers and Seedsmen or post paid from Makers. **KAY BROTHERS LIMITED.** Kayborough, Reddish, Stockport. (Send P.O.)

MISCELLANEOUS WANTS

CAKE Decorations, supplies wanted.—Box B2298.

CROWN corks required, fitted with composition or second-grade natural cork discs. Willing to purchase surplus stocks as 1s. 6½d. per gross ex seller's factory.—Write Box B2296.

GELATINES
PURE FOOD QUALITIES

Enquiries from licensed and other authorised buyers solicited.

PROMPT DELIVERIES

K. J. LIEBMANN
14 Seething Lane, London, E.C.3
Tel.: ROYal 1946/7

MICE.—You can't afford mice on your premises. Be rid of them by sprinkling "Scram" round the holes and where the traces are. Non-poisonous—harmless to pets. Prices: 14-oz. tins, 1lb.; 2-lb. tins, 20s.; 4-lb. tins, 35s.; 7-lb. tins, 60s. — Order from the manufacturers (Dept. P.M./C), Scram Products Ltd., Dartmouth Park Hill, N.W.5.

L. STENG & SON
342 KENNINGTON RD.
LONDON, S.E.11
•
HERBS
ENGLISH AND IMPORTED
SPICES
CONDIMENTS
DRIED VEGETABLES
•
ENQUIRIES INVITED
RELIANCE 1136/7

100% SATISFACTION GUARANTEED
WATER SOFTENERS
ON RENTAL — MAINTENANCE
NO CAPITAL OUTLAY
LIME-FREE WATER
& GENERAL SERVICES LTD.
7 Grosvenor Gardens, London, S.W.1

SITUATIONS VACANT

WANTED, services of Chemist with experience in the manufacture of sauces, malted foods and cereals, in advisory capacity and later for full time employment. Factory within 20 miles easy reach of London.—Box B2311.

CO-OPS. Experienced Salesman required for contacting Co-operative Societies' Buyers of Foodstuffs throughout the country. Salary, expenses and commission. Applicants will be required to show proof of live connections and first-class sales record.—Box B2317.

RESEARCH Chemist required for Midlands Food Factory. At least B.Sc. honours in chemistry or bio-chemistry. Salary according to experience, qualifications.—Apply giving details experience, qualifications, salary required, Box B2318.

LONDON COUNTY COUNCIL

REQUIRED at Smithfield College of Food Technology, Eagle Court, St. John's Lane, E.C.1, to commence in January, 1949, part-time visiting lecturers in basic scientific subjects for students engaged in the Food Manufacturing Industry on Monday and Thursday afternoons), including elementary physical and chemical concepts, elementary microbiology, principles of food preservation, public health aspects of food handling and rodent and insect pests (lecture and practical). Fee per attendance: 13s. 6d. for the first hour and 9s. for each subsequent hour. Application forms (stamped addressed foolscap envelope necessary) from the Principal at the College. (2170.)

REQUIRED for several regions in England: technical representatives working on commission for the sale of modern plant for the concentration of fruit juices, milk, whey, chemicals, etc. Good commission offered to the right men.—Box B2321.

DEMONSTRATOR required by Manchester food manufacturers. Must be capable of demonstrating to bakeries, canteen supervisors, chefs and other similar users of the firm's products. Previous experience essential. Must be prepared to travel throughout the country. Good salary and prospects.—Box B2322.

CHEMICAL Engineer, preferably single, with knowledge of production of cornflour and other cereal products, required for progressive company in East Africa. Salary £60/70 per month; free accommodation.—Write in first instance, stating age, qualifications, etc., to Box M.4068, Haddons', Salisbury Square, London, E.C.4.

AGENTS or representatives wanted, calling on Bakers and Bakers' Sundriesmen. Territory available London area, Wales and North of England, to introduce a first-class emulsion and food products already well known. Every encouragement given to the right men. When replying, please give full particulars of connection and lines already handling.—Box B2291.

EXPERIENCED Chef required for research on ketchup and allied products and for control of the manufacture of soup and bakery lines in rapidly expanding factory in Hertfordshire.—Apply Box B2209.

SUGAR Boiler accustomed to quality and quantity production for leading Scottish House.—Write full details including wages required to Box 1130, Robertson and Scott, Edinburgh 2.

FOOD Factory, East London, require man with some experience in pickle or fish paste production as Works Manager of small branch factory. Progressive and permanent position.—Write stating full details and salary required to Box B2251.

REPRESENTATIVES having connections with Food Manufacturers required for London and all areas by Waxed Paper Manufacturer.—Write with full details, Diamond Waxed Papers, Heybridge, Maldon, Essex.

REPRESENTATIVES required, London area, also Home Counties and Midlands. Old-established (small) Sauce Manufacturing Company wishes to obtain representation for the sale of its products, particularly in the London area. Free-lance representation on commission basis preferred, but would consider part expenses and commission basis. Applicants must be well established with Wholesale Houses, Multiple Stores, Co-operative Stores, etc.—Box B2334.

CHEMIST wanted for large food factory in Birmingham, to start research on Flavour, Ingredients, etc. Young man preferred.—Box B2326.

CEREAL chemist required to take charge of Laboratory and Test Bakery of 40-sack Flour Mill and Provender Mill in north-west area. Applicants should be fully conversant with all modern routine tests of flour and feeding stuffs, and capable of carrying out experimental work.—Applications should be addressed to Carr's Flour Mills Ltd., Solway Mills, Silloth.

Classified Advertisements

in FOOD MANUFACTURE

MUST BE PREPAID

3d. a word, minimum 4s.

Box numbers 1s. extra.

Replies to

BOX NUMBERS

should be addressed to

Food Manufacture, 17, Stratford Place, W.1

SITUATIONS VACANT

WANTED, representatives calling on Food Manufacturers, Bakers' Sundriesmen, Bakers, etc., to handle attractive lines of essential materials. Good commission.—Box B2300.

LEADING manufacturers in Lima, Peru, require working foreman of British nationality, age 25-35, single or married with not more than 2 children (who must be of the same sex). Must have sound knowledge of high and medium class biscuit manufacture, preferably automatic plant. Starting salary will be $1,500 per month with bonuses (rate of exchange 26·16 to £1). Free house and light. The house, which is furnished, is a new bungalow with a large lounge, dining room, bath room, two bedrooms, electric kitchen, servants' quarters and small garden. Air passage will be paid for man and wife and up to two children. Contract will be for three years and will be renewable, with three months' passage paid holiday at the end of each three years. Knowledge of Spanish not essential but successful candidate will be expected to study the language. Applicants for the post should be temperate, in good health and able to control labour tactfully.—Give full details of working career and include a photograph to Box B2324.

DRAUGHTSMAN required in Engineer's Office of Canning Factory in East Anglia, preferably with experience of Food Plant. Single man preferred owing to housing accommodation. Knowledge of Steam, Water, and Effluent Disposal layouts an advantage.—Write full particulars of experience and salary required, Box B2329.

YOUNG Chemist, 20-25 years, preferably with experience of food analysis, required for small laboratory of preserve manufacturers, in Sussex.—Please write giving full details of experience, age and salary required, to Box B2293.

WANTED, Working Works Manager familiar with the manufacture of cake flours, etc. Used to handling staff and taking responsibility. Good salary and permanency.—Apply with fullest particulars to Mansfield Food Products Company, Dame Flogan Street, Mansfield.

CHEMICAL Engineer. Young man of an enquiring nature with ability to write, interest and some knowledge of world affairs required to edit a technical journal. Help and direction given. Large established Company. Commencing salary £700. Three refs. copies.—Box B2301.

GENTLEMAN, young, chemical engineer or chemist to represent a technical export journal. Selling experience unnecessary. A man with confidence and initiative will earn a high salary if successful. £600 p.a. and commission.—Apply with copy references to Box B2302.

A PROGRESSIVE food manufacturing company in the South London area has vacancies for the following:—(1) Qualified Food Chemist to take charge of analytical and factory control work, commencing salary £600/£700 approximately, according to experience and qualifications. (2) Food Chemist of or approaching Degree standard for research and development work, salary £375/£450 approximately, according to experience and qualifications. Permanent position, excellent prospects, superannuation scheme, and 5-day week.—Write stating age, experience and qualifications to Box M.4004, Haddons', Salisbury Square, London, E.C.4.

POLAK & Schwarz (England) Ltd., 50, Great Cambridge Road, Enfield, Middx., require lady laboratory assistant for Essence Laboratory. Some experience in the Food Industry an advantage.—Write in strict confidence to General Manager, giving full details of age, education, experience, etc.

GEORGE COHEN'S 600

FOR SALE

ONE Self-generating Caramel Mixer comprising jacketed copper Pan 2 ft. 2 in. diam. by 1 ft. 9 in. deep (to take 1 cwt. of toffee). Pan mounted on c.i. stand and provided with fast and loose pulley driven bow and scrapper type agitator. Pan arranged to tilt, suitable for 100-lb. working pressure. Rise and fall of agitator mechanically operated. Gas stove with small blower fitted under Pan, blower driven by pulley from main shaft. Heat applied to water by gas burner and steam generated in jacket of Pan.

Stainless steel Food Preparation Tables, 7 ft. 8 in. by 3 ft. 8 in. by 2 ft. 8 in. high, and 5 ft. 8 in. by 2 ft. 8 in. high. Polished, with adjustable feet. Available for delivery mid-December.

One Twin Roll Drier by Goudche of Gouda, Holland. Rolls 6 ft. 7 in. long by 2 ft. 3 in. diam. steam heated through trunnions and driven from 10 h.p. 400/3/50 electric motor through 1000:61 reduction gearbox on common bedplate. Drier equipped with fume hood, 2 discharge worm conveyors, and one spare roll.

All types of stainless steel Storage and Process Vessels. Large stock available for immediate delivery.

Four stainless steel Steam Jacketed Tilting Mixers, 18 in. diam. by 18 in. deep, mirror finish inside and out, rubber covered paddle agitator, driven through Croft Worm Reduction Gearbox from ½ h.p. Crompton Parkinson totally enclosed geared motor with Allen West Starter. Mixers mounted in "A" frames.

One Electric Mincing Machine by Lancashire Dynamo & Crypto, type A.12, for 200/220 v. single ph. 50 cyc., complete with 16 in. diam. white enamel feed bowl.

One "U" shaped horizontal unjacketed Dough Mixer by Alfred Hunt, 2 sack size. Mixer body 3 ft. 8½ in. long by 2 ft. 2½ in. wide by 2 ft. 10 in. deep, fabricated from sheet aluminium with c.i. ends. Vitreous enamelled double helical agitators. Drive through totally enclosed reversing gearbox. Automatic tilting. Mounted on c.i. bedplate fitted with tempering tank 18 in. by 16 in. by 32 in. deep.

One 2-stage Curd Mill by Gardner, comprising 2 sets of twin serrated rolls, 1 ft. 10 in. long by 9 in. diam. Each pair of rolls spring loaded and independently driven through gearing by belt pulley. First pair of rolls arranged vertically above second pair. Frame c.i. construction fitted with 3 hinged inspection doors, 14 in. long by 5 in. wide.

One Vacuum Evaporating Plant by Morton, comprising tinned copper Pan, approx. 8 ft. overall depth by 5 ft. i.d. Steam jacketed with internal steam coil of 3 in. o.d., solid drawn copper pipe, complete with Condenser and Vacuum Pump. Capacity of Evaporator 300 gall per hour.

One 3-throw Homogeniser by Astra, approx. capacity 300 gall. per hour, 1⅞ in. bore by 4½ in. stroke, bronze rams and pump block, triple roller chain driven, eccentric mechanism enclosed in oil bath, 2½ in. inlet, ¾ in. outlet. No motor included.

One 4-throw Homogeniser by Rannie of Copenhagen, capacity approx. 300 gall. per hour. 1⅞ in. bore by 2½ in. stroke. Fitted stainless steel rams and pump block, and bronze guide bearings running in c.i. outercasing 1½ in. diam. inlet and 1⅜ in. diam. outlet. Drive by twin inverted-tooth sprocket and chain. Motor platform mounted over machine. Motor not available.

One Standard 5-roll Chocolate Refiner by Joseph Baker, water cooled, chilled rolls, 33 in. long by 13 in. diam., top roll 19 in. diam. Fast and loose pulley drive, through helical and spur gearing, complete with oil bath, gear cases, feed hopper, etc.

GEORGE COHEN

SONS & CO. LTD.

SUNBEAM ROAD, LONDON, N.W. 10 Tel.: Elgar 7222

& STANNINGLEY, Nr. LEEDS

Tel.: Pudsey 2241

The Strongest Vanilla Flavour

VANOLEUM

1 oz. (2/6) makes a pint of essence

For further details apply

ARTHUR WHITTAKER

Newton Heath, Manchester, 1

SITUATIONS WANTED

FOOD Technologist, 34 years, trained bacteriologist, 13 years' experience modern canning practice, factory management, laboratory and production control. Extensive knowledge and experience mechanisation and plant maintenance. Responsible position required home or abroad.—Write Box B2330.

CHEMIST, M.Sc., F.R.I.C., considerable experience in food chemistry and technology, specialist in milk and milk products, including ice-cream, desires change. Position sought for control and development work in food industry.—Box B2303.

HIGHLY competent Food Expert, over 22 years' experience in food manufacture and distribution, at present in responsible position with a medium-sized firm of Multiple Caterers, desires change giving greater scope. Dominions or Continent considered—Box B2320.

HONOURS graduate in Chemistry having a wide experience in the milk, chocolate, confectionery and flour confectionery industries with firms of world reputation, wishes change, and is now free to take up a high executive post, preferably as a director or with directorship in view. Until recently engaged as general manager to a very large and successful public company.—Box B2319.

YOUNG works manager, good general knowledge in canning and sauces, seeks change for responsible position. Prepared to go overseas.—Box B2333.

TECHNICAL Director (D.Sc.) of large nationally well-known firm producing a variety of branded foods desires change giving greater scope. Excellent scientific background combined with first-class practical experience. Age 38. Great Britain or Dominions.—Box B2258.

WANTED, administrative position fruit, vegetable Canning industry, either U.K. or South America. Previous experience and training in England and India. Contact cable or air.—Karkare, Oppo. Distillery, Nasik Road, India.

CANNERY manager with many years administrative and technical experience, having recently relinquished the managing directorship of large public company and other interests outside the U.K., seeks executive post in the industry at home or in the Colonies. Exceptional experience, including overseas research, and intimate knowledge of production methods with fish, meat, vegetables, soups and fruits.—Box B2337

TINPLATE

SCREW CAPS

All colours and sizes

to 50 mm.

•

BRENELL ENGINEERING CO.

2, NORTHINGTON ST., LONDON, W.C.1

Phone: HOLBORN 7358

St IVEL

DRIED PARSLEY

GROWN, DRIED AND PACKED IN THE COUNTRY FOR THE TOWNS

Enquiries for the above and other Herbs to

APLIN & BARRETT LTD.

YEOVIL · SOMERSET

BUSINESS OPPORTUNITIES

MANUFACTURERS' Agent, established Cape Town, covering Union of South Africa for leading British biscuit firm and other food products, seeks a few first-class Agencies in food trade.—Write Box FM, 880, L.P.E., 110, St. Martin's Lane, W.C.2.

THE Electroplant Company, Wembley, for any type of special duty elec. plant. Specialities Converters, Gen. Sets. Electrical test equipment. Ask for production range.

A SKILLED team of Engineers and Fitters available for outside erection or dismantling, survey, inspections, etc., of large power plant of any description.—For details write to G.P.U., Ltd., Service Division, Wembley.

ADVERTISER having experience in the business of rusk manufacture is open to acquire such a business or to invest capital therein.—Box B2304.

AGENT required by established house. One with connections among Food and Chemical Manufacturers and users of Filter mediums. Attractive proposition.—Box B2305.

WELL-KNOWN Food Manufacturers with factory premises in Eire, are open to undertake the manufacture and packing in Dublin of other manufacturers' goods for Eire and export markets. Sale and distribution on the Eire market can also be undertaken, if desired.—Box M.4011, Haddons', Salisbury Square, London, E.C.4.

FULL steam in five minutes with B. & A. Electrode Boilers, used by British industries for 20 years. No boilerhouse, no flue, no attendant needed. The most compact and convenient steam raisers available, can go beside machines using the steam.—Write for Leaflet 125, Bastian & Allen Ltd., 11, Bedford Square, W.C.1.

MIDLAND Firm of Bottlers, well equipped, able take on additional work. Enquiries solicited.—Box B2284.

SCOTS Preserved Food Canners are open to consider packing specialty articles for any large wholesale house.—Apply Box B2200.

QUALITY Foodstuffs wanted on agency basis for U.S.A., Bermuda, British West Indies, Dutch West Indies, by London Company having active representatives in these areas. Prepared pioneer new products of distinct quality.—Replies in confidence to Export Manager, Box B2218.

THE proprietor of British Patent No. 509,389, entitled "Improvements in or relating to the manufacture of cheese," offers same for licence or otherwise to ensure practical working in Great Britain.—Inquiries to Singer, Ehlert, Stern and Carlberg, 28 East Jackson Boulevard, Chicago 4, Illinois, U.S.A.

OWNERS of old-established businesses wishing to retire should consult Business Brokers Ltd., 46, St. James's Place, London, S.W.1 (Regent 4720). Many buyers available, particularly for large propositions.

NATION-WIDE sales organisation with remarkable record of successful merchandising is open to consider one or two new lines. Only branded lines offering possibilities of big permanent business are of interest.—Box 553, c/o Erwoods Ltd., 211, Piccadilly, London, W.1.

ADVERTISER with Capital and Small Factory Premises available invites propositions from Food Manufacturers, Distributors, etc. London area.—Box B2338.

PLAIN TINS - CONTAINERS

ROUND AND SQUARE

LEVER AND SLIP LIDS

ALSO PRINTED LABELS FOR ABOVE

HAWKER & CO.

120, Pentonville Road, N.1. *Ter. 4588*

FOOD manufacturing company in Eire, with staple and proprietary lines for pharmaceutical and grocery trades, also export licences and access to all necessary raw materials, invites capital investment. Directorships offered, with assistance in management and control. Principals only.—Apply, with banker's reference, Box B2309.

ARKS PUBLICITY LTD.

with 25 years' experience in Advertising, offer an efficient and Personal service to all clients.

Write to:

ARKS PUBLICITY LTD.,

32, Gt. Queen Street, London, W.C.2

BUSINESS OPPORTUNITIES

MONOMARK Service. Permanent London address. Letters redirected. Confidential. 5s. p.a. Royal patronage.—Write Monomark [illegible] MONO55, W.C.1.

COMPLETE manufacturing business for sale with all licences, allocations and quotas of all necessary materials for production of powdered products. New automatic plant easily installed is available, together with registered trade mark and sales connections. Price required for business as a going concern is very reasonable. £7,500 plus raw and packing materials at cost.—Reply in strict confidence to Box B2237.

BELGIAN jam manufacturer would consider manufacturing on behalf of one or more substantial British firms. For fuller particulars apply to T. Gunn (Rayleigh) Ltd., 206, London Road, Rayleigh, Essex.

WEST Sussex Grower with excellent facilities and expert knowledge wishes to contract for growing of specialised crops to food manufacturers' requirements, up to 20 acres available next season.—Box B2269.

FIRM in North of England, having established connection with Chocolate, Toffee and Biscuit Manufacturers throughout the British Isles since 1908, is willing to represent manufacturers of raw materials for these trades on commission and expenses basis.—Box B2166.

TECHNICAL Chemist with wide experience in several industries undertakes industrial investigations on a reasonable retaining fee basis. Any problem investigated.—Box B2334a.

EIRE: Large firm of distributors having with connections with wholesale grocery and wholesale druggists trades, the milling and bakery trades, as well as a wide range of industries, having large modern warehouses with own transport, and extensive sales organisation covering the entire country, seeks sole distribution of products of reputable cross-channel firms. Manufacturers interested in extending their trade in Eire please communicate, in first instance, to Box B1861.

WARNING NOTICE.

"GUMSTRIP"

is the Registered Trade Mark (No. 544833) of Samuel Jones & Co. Ltd., and its use in connection with Sealing Tapes or Adhesives or Gummed Paper Tape other than that supplied by Samuel Jones & Co. Ltd., is an infringement.

Appropriate action will be taken in all cases which come to the proprietors' attention of the use of this Mark in connection with goods other than those manufactured by Samuel Jones & Co. Ltd.

IF you Manufacture Shell Fish Pastes use as the base 100% Pure Quick Frozen Crab Meat.

Boned Herring, Fresh or Quick Frozen, supplied for canning and other methods of processing.

Enquiries to ARTHUR'S OYSTER BAR (SUNDERLAND) Ltd., 32 Blandford Street, SUNDERLAND.

All kinds of

GELATINES

CAKE AND GROUND

ALMONDS	DES. COCONUT
BRAZILS	AGAR-AGAR
WALNUTS	GUM ARABIC
HAZELNUTS	ALBUMEN
GINGER	COCOA BUTTER
TARTARIC ACID	SAGO FLOUR
FARINA	CORNFLOUR

GLOBE 3a, the Health Glucose

T. M. DUCHÉ & SONS

(U.K.) LTD.

MANCHESTER LONDON GLASGOW

SECOND-HAND PLANT WANTED

ADVERTISER wishes to purchase Puffed Wheat Gun, new or secondhand, in good condition.—Offers to Box B2297.

WANTED, Equipment for the manufacture of sauces.—Box B2310.

NEW or secondhand Shell and Tube Condenser. Fitted Copper or Brass Tubes. Surface 700 sq. ft. —Offers to Yorkshire Casein Mnfrs. Ltd., Wakefield.

ROLLER Drier required for Milk Drying, capacity 1 cwt. per hour.—Box B2328.

WANTED, modern horizontal or vertical Diesel Engines in good working order. Should be available for quick delivery.—George Cohen Sons & Co. Ltd., Wood Lane, London, W.12, or Stanningley, Nr. Leeds.

CHARLES GRIFFIN & CO. LTD.

Jorgensen's

Micro-organisms and Fermentation

By **Albert Hansen** 7th Edition

550 pages 88 figs. **Price 60s. net**

Cold Storage Practice

By **A. E. Miller** 1st Edition

246 pages 51 illus. **Price 27s. net**

42 Drury Lane, London, W.C.2

GRINDERS, CRUSHERS, SIFTERS, MIXERS, DRIERS, ETC.

WE HAVE SPECIALISED ON THIS CLASS OF MACHINERY FOR OVER 40 YEARS

W. S. BARRON & SON, LTD

(DEPT. A)

GLOUCESTER

Telephone: 2288 Gloucester

Telegrams: Barron, Gloucester

JOHNS, SON & WATTS LTD.

THE PACKAGING SPECIALISTS

Boxmakers and Litho Cartons

Solid and Rigid Boxes

Packings for Special Purposes

U.S. & W.

84 EPWORTH ST. LONDON E.C.2

SECOND-HAND PLANT FOR SALE

250 GALLON per hour Homogeniser in perfect condition. Also 700 Ice Cream Moulds, 1½ and 2 gallon capacity, for sale.—Telephone: Ripplewaу 3361, Dicky Bird Limited, Bye-Pass Road, Barking, Essex.

PHONE 98 STAINES

GARDNER Horizontal Power Mixer 5 ft. by 19 in. by 21 in.; Young's Powder Sifter and Mixer; 100 gall. Copper Jacketed Still and Condenser; Stern Haslam Ammonia Refrigerator Plant; Artofex Bowl Mixer; Miracle Mill 24 in. dia.; 3 ft. 6 in. Edge Runner Mil (Stainless Coated); Electric Hydro Extractor 36 in., 415/3/50; "G.E.C." Electric 2 Deck Baking Oven.—Harry H. Gardam & Co. Ltd., Church Street, Staines.

MEADOWS self-contained petrol driven electric Arc Welding Sets suitable for electrodes 6 to 14 SWG. Immediate delivery.—Fyfe, Wilson, Bishop's Stortford.

FOR Sale, Refrigerator, 1,200 cubic ft., 3½ h.p., by York Shipley.—Box B2306.

ONE pomace breaker; 1 water softener, Permutit Type IDG 15; 2 confectioner's wheeled racks complete with mesh trays, drying apparatus; 1 Impetus bottle washer; quantity wire fruit trays, square and round pickle jars, galvanised wire trays to hold 6-pint milk bottles.—Box B2307.

COMPLETE root starch plant complete with all auxiliaries, motors, boilers, water softening plant, etc., to deal with 8 tons of roots per hour, available for immediate delivery.—Box 8, Dorland, 18/20, Regent Street, S.W.1.

2 SOLID Cast Aluminium Tanks, fitted for draining taps, brand new, perfect condition, each 3 ft. long by 2 ft. 6 in. by 2 ft. 6 in., for disposal.—Phone or write Monnickendam Ltd., 51a, Carysfort Rd., N.16. Clissold 0471, for appointment to inspect.

1 "INTERNATIONAL" Clock and Time Recorder (numbered for 150 employees). Weekly charts, six changes; Quantity Metal Retort Trays; 18 "National" Labelling Machines complete with ½ h.p. 230 volt motors; 1 "Morris" Hand Operated 3-cwt. Stacking Machine; 1 "Lamond" fish heading and gutting machine with ¼ h.p. single phase motor; 3 Hand Sausage Filling Machines, "Williams" Barrel Type; 2 "Tettbro" Water Softeners; 1 Letter sealing machine; 2 "Roneo" Addressing Machines (No. 40); 1 Paper Fastening Machine; 1 "Normand" ¼ h.p. motor 400/440 volt with reduction gear, 14 r.p.m.; 1 Ferguson & Timpson "Aquastat" Water Treatment Installation.—Box B2316.

4 EUK Bread Slicing Machines, 2 suitable for 230 v. S.P. A.C. supply and 2 for 230/240 v. D.C. supply. In excellent condition. Can be seen N.W. London.—Apply Box B2327.

VEGETABLE Dicers, twin head; Benham 4-Oven Steamer; Drying Oven, 6 ft. by 3 ft. 6 in. by 5 ft.; Peerless Potato Peeler, VP 28 model; B.C.H. Fruit Stripping Machine; Gooseberry Snibber; B.C.H. Candied Peel Cutter; 30/80 quart Planetary Mixing and Whisking machines by "Hobart," "Read," "Peerless"; Brass-lined Paste Mixer; Werner "Z" arm mixer 15 in. by 8 in. by 12 in.; Burnell ¼-ton Drum Kneader or Mixer; Open Bowl Kneaders, 1 sack and ½ sack; B.C.H. Open Pan Fondant Mixer; Jacketed Mixing Kettles, 350-lb. size; Drying Rolls 26 in. by 12 in. dia.; 3-roll horizontal steel refiner, 26 in. by 12 in. dia.; 3-roll Vertical Chilled Steel Refiner; "Turner Vertical Double Twin Roll Mill, 25 in. by 9 in. rolls, for rice or cereal milling; Gardner's Power Kibbler; Collier 18 in. flat-disc Grinder; Ideal Pulverising Grinding Mill; Gardner Centrifugal Reel Dresser, 5 ft. by 17 in. dia.; "Bartlett" 1-cwt. Gas-fired Roaster; Lehmann 2-cwt. Bean Roaster, open firing, open discharge; Triple flat stone Liquid Cocoa Mill, 26 in. dia. stones; Granite Melangeur, 4 ft. 6 in., with granite twin head stones; Reiche Chocolate Drop Press; Chocolate Enrobers, 16 in., with tunnel cooler, 50 ft. ammonia coils, chocolate bar and figure moulds; Rose Twist Wrapping Machine, ¾ in. by ¾ in.; Plastic Cut and Wrap Machines; Can or Bottle Labelling Machine, 120 per minute output; Wire Stitching Machines; Cardboard Slotter and Cornering Machine; Cardboard Hand Shearing Machine; B.C.H. Caramel Press; Caramel Cutters; Brakes, Nougat and Cream Cutters. A small selection of our stock, all enquiries invited.—E. W. Wallbridge, 136, Sefton Street, Southport. (Cables: Wallbridge, Southport.)

FOR sale, Labelling Machine, 14 in. rollers, by Farrow & Jackson. Sausage filler. Gas steam heated retort, 3 ft. high by 1 ft.-8 in. diam. Large bowl cutter. Berkel slicer. Small 2-pan gas fryer. —Box B2336.

SECOND-HAND PLANT FOR SALE

THREE Base Exchange Water Softeners. 5,000 to 50,000 gall. between regenerations. These plants have been fully reconditioned and are charged with new softening medium, are as new. Prices include delivery, erection and starting to work. Each plant has a 5 years guarantee. Terms if desired; inspection invited.—Boyd-Chambers, Consulting Engineers, 4, Titian Avenue, Bushey Heath. Tel.: Bushey Heath 1831.

JACKETED Werner-type Mixer by Baker Perkins, 21 in. by 20½ in. by 18½ in., double Z blades, safety locking lid, fast and loose pulleys; Bowl Chopper by John Gardner, bowl size 39 in. diam. by 11 in. deep; Buffalo Bowl Chopper by Smith, bowl size 30 in. by 8 in. deep; Hills Bottle Washing Machine, 50 doz. per hour, complete with A.C. motor; 3 Labelling Machines by J. W. Flower, complete with motors; 55-gall. capacity Copper Jacketed Boiling Pans, 65 lb. working pressure, hand tilting.—Box B2254.

HODSON & CO. (Machinery), Ltd., Tottington, Bury, Lancs., England, for Surplus Chemical Plant. Immediate delivery. Low prices.

NEW stainless steel-lined Fruit Pulping or Sauce Sieving Machines fitted with 9 in. stainless steel sieve, pully driven, or motorised if required. Immediate delivery.—C. Sherman and Sons Ltd., 118, Putney Bridge Road, London, S.W.15. Tel.: Putney 2406-2407.

BOTTLE Labelling Machine by Anker Bros., complete with single phase A.C. motor suitable for fish paste jars. One International semi-automatic Labelling Machine suitable for round bottles or jars, excellent condition.—Box B2230.

LABELLERS for quick delivery. We have a number of New Labelling Machines available for quick delivery. Machines will handle a wide range of bottles and labels. Send details of your requirements, including sample labels.—Box B2031.

FOR Sale, one "E" size Gardner Sifter and Mixer, complete with 3-h.p. A.C. motor.—Richard Sizer Ltd., 21, Dale Street, Liverpool, 2.

3 CWT. size Combined Sifting and Mixing Machine, new, with or without 3-h.p. A.C. motor.—Makers, D. Burr & Son, Drayton Engineering Works, Drayton Place, West Croydon.

NEW Wright and Marvin Model "A" Round Can Labelling Machine, complete with A.C. motor; Purdy Junior Labelling Machine; 2 Labelling Machines by J. W. Flower, complete with motors; Mikro Pulveriser, Model No. 2 T.H., £150; Horizontal Drum Mixer by Burnell, 2 ft. long by 3 ft. diam., belt driven; £100.—Box B2255.

WE have the largest stock of Can-making Machinery in the country, comprising: Body Formers by Bliss and Troyer Fox, Flangers, Double Seamers and Stationary Closing Machines by the world's best makers. Send us your enquiries for small units or complete installations.—F. J. Edwards, Ltd., 359, Euston Road, London, N.W.1.

VACUUM Bottle Filling Machine, two or three heads, complete with motorised pump, suitable for all size bottles and any liquids. New condition —The English Orchard Co. Ltd., 83-85, Evelina Rd., Nunhead, S.E.15.

AN Excellent Base for sandwich pastes, fish cakes, etc. FRESH, hand-graded COD FLAPS, 24/- per cwt., carriage paid. Any quantity supplied. — Fred Smith, Fish Curer Albion Street, Grimsby.

DRIED VEGETABLES

VEGETABLE EXTRACT

DRIED HERBS

•

WILLIAM BRYAN LTD.

3 LOVAT LANE

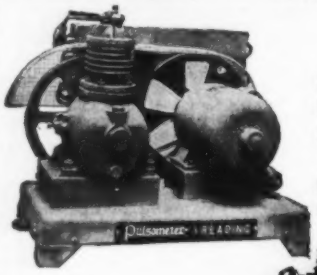
EASTCHEAP

LONDON, E.C.3

Telephone: MANSION HOUSE 1457

TRADE Pulsometer MARK

ICE-MAKING AND COOLING PLANTS



Characteristics :

Economy in running
Freedom from breakdown
Low maintenance cost and
Efficient, satisfactory and lasting service.

Methyl Chloride System of Refrigeration — for Milk Cooling and small Cold Storage Requirements. Automatically Controlled.

Medium Speed Twin-cylinder Ammonia Compressor—for Ice-Making and larger Cold Storage and other Refrigeration Requirements.

List No. 3004

Pulsometer Engineering Co. Ltd.,
Nine Elms Ironworks, Reading.
Established 1875

Mitchell

CONTINUOUS FALLING TRAY BAND TYPE DRYER

It's the 'know-how' which counts in planning dryer installations—scarcely any two jobs are identical. Draw upon the vast accumulated experience of the Mitchell organisation, who know every kind of drying problem.

Illustration shows Mitchell continuous falling tray band type dryer in foodstuffs factory, in which both sides of the band are used.

L. A. MITCHELL LIMITED
37 PETER ST., MANCHESTER 2
Phone: BLAckfriars 7224 (3 lines)

MDc

SUTCLIFFE puts the SEAL on your reputation

You take the most scrupulous care in the manufacture of your products, yet all your efforts can be negatived *after* packing if the cap of your glass container is a faulty fit. Make sure of a perfect fit every time by using Sutcliffe jars and closures.

J. W. SUTCLIFFE & CO.
Glass Bottle Manufacturers
12 GREAT PORTLAND ST., W.1
Telephone: Museum 7263 (3 lines)

VS-20

CAROTENE

PRO VITAMIN A

CRYSTALLINE CAROTENE
of a high degree of purity with a potency of over 1½ million International Units of Vitamin A per gramme

CAROTENE CONCENTRATES
with potencies ranging between 10 million and 30 million International Units of Vitamin A per pound

Used as a source of Vitamin A in the enrichment of margarine, chocolates, and other food and pharmaceutical products.

BRITISH CHLOROPHYLL CO. LTD.
NAVENBY, LINCS

•

Sole Distributors:
FREDK. BOEHM LTD.
19, Bentinck Street, London, W.1

Printed for the Proprietors, LEONARD HILL LIMITED, and published by them at their Offices, 17 Stratford Place, London, W.1 by Billing and Sons Ltd., The London Printing Works, Guildford and Esher, England

Youre telling me!

"In a survey of 2,200 small American steam plants only 8% were found in first-class operating condition. . . . Amongst the plants which had control and metering equipment installed, about 25% were found to be using the equipment wrongly, or it was out of order or indicating incorrectly."

It couldn't happen here!

Or could it? It's a sure thing that any plant with faulty controls is running the risk of spoilage, needs more supervision and is almost certainly wasting fuel. Fitting the wrong type of regulator for the job is just about as dangerous as having a regulator which does not function properly. It can jeopardise production—and is a dead loss in itself. DRAYTON make ALL types of regulators and can give impartial advice.

SELF-OPERATING REGULATORS

These are undoubtedly the simplest to install and usually the lowest priced. They have a wide range of legitimate application, but, where strict control within a close margin is desired, more flexible and sensitive types of regulators should be used.

RELAY REGULATORS

These provide a high degree of accuracy in control. The thermostatic device operates a small pilot valve only and can respond sensitively to minute variations.

ELECTRIC REGULATORS

In these, automatic switches actuate motorised control apparatus. Drayton make a wide range of electric switches with the complementary control apparatus for every kind of application.

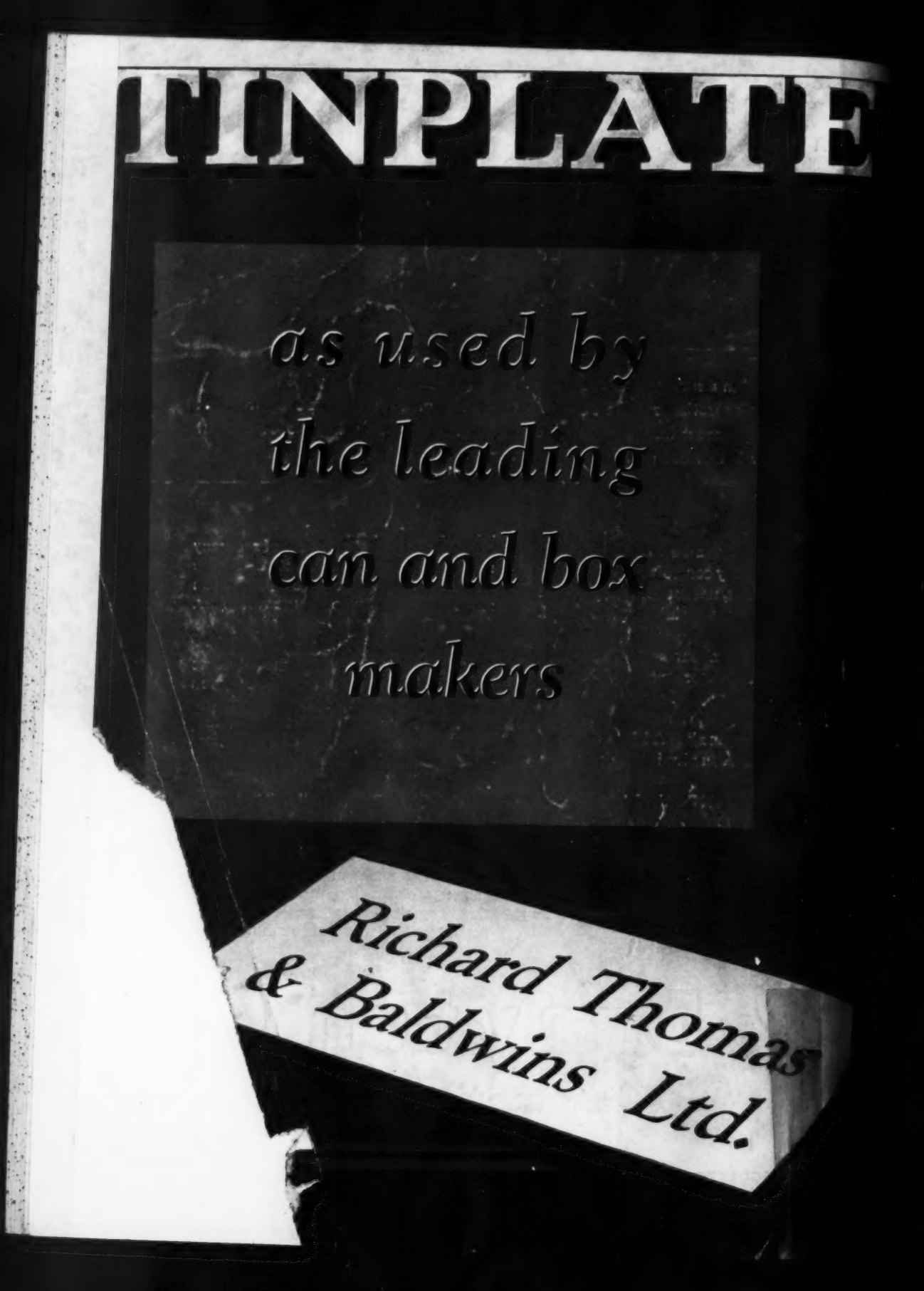
TEMPERATURE AND PRESSURE INSTRUMENTS

Drayton make dial thermometers: perature and pressure recorders mercury in steel or vapour tensi for a wide range of applicati gauges, including high duty ir that combine great sens resistance to damage thro

Drayton

for Automatic Co

DRAYTON REGULATOR & INSTRUMENT CO. LTD.,


TINPLATE
as used by
the leading
can and box
makers
Richard Thomas
& Baldwins Ltd.